SEP 6

SEPTEMBER 1940

FOOD INDUSTRIES

HOMES OF FAMOUS FOODS . . . PLANT OF NATIONAL CANDY CO., ST. LOUIS

IN THIS ISSUE:

New Methods of Treating Milk Wastes

The Real Issue in the Sweetener Controversy

Efficiency in Handling Materials

What People Think of Food Advertising

How the War May Affect Supplies of Tin

McGRAW-HILL PUBLISHING COMPANY, INC.

RESCUED WITH A BY-PASS

A CASE STORY

SOLVED WITH PREVENTIVE MAINTENANCE

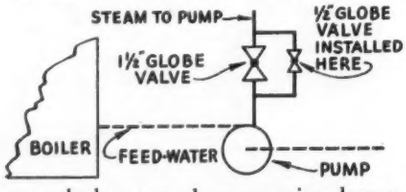
"Man alive"—shouted the SUPERINTENDENT—"we just replaced that valve a short time ago!"

"But we can't let the pump run wild"—the PLANT ENGINEER tried to explain.

"Sure enough"—said the CRANE MAN—"but Preventive Maintenance will stop the source of trouble."

AN eastern plant was having endless trouble with a valve on the boiler feed pump. It was a steam-driven pump—controlled with a 1½-inch globe valve.

Under peak loads or in an emergency, this valve was ideal. But for normal feed-water needs it was much too large. Most of the time the steam was throttled so close that the disc and seat were barely "cracked." As



a result they soon became wire-drawn and the valve began to leak—a dangerous and wasteful condition.

Pulling the fire to make valve repairs was costly. A permanent remedy for the trouble had to be found. "Here is a case for Preventive Maintenance," said the Superintendent as he called in D. N. G., the Crane Man, on the problem.

Preventive Maintenance counseled the installation of a ½-inch globe valve in a by-pass line around the present valve. With the large valve closed tight, the ½-inch valve, when fully open, would assure ample steam for normal pump operation. For emergency loads, the 1½-inch valve would be available—but rescued from severe throttling service.

Results: (1) The trouble was eliminated—permanently, easily. (2) Again Preventive Maintenance paid for itself many times over. (3) Another management knows that it can rely on Crane for sound advice and the right valves and fittings to solve every piping problem. Knows, too, that it's best to call the Crane Representative whether the trouble is big or little.

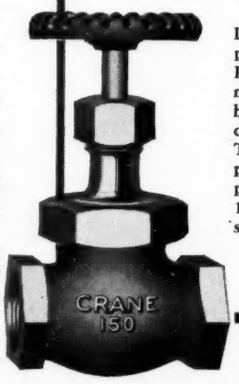
This case is based on an actual experience of a Crane Representative in our Syracuse Branch.

FINE FLOW CONTROL WITH CRANE BRASS PLUG DISC VALVES

In any service—steam, water, oil, gas—where valves must operate in partly open position or are frequently opened and closed, in every way these valves will give better performance than you would expect.

Crane plug-type disc construction assures accurate and easy regulation of flow, and a longer life of positive tightness. The wide seating surface and the perfect combination of alloys in the tapered disc and seat give unusual resistance to the damage of foreign matter and wire-drawing, to wear and galling. A sturdy brass body and careful engineering in every part make these valves extra fit for the toughest jobs.

Crane Brass Plug Disc Valves are the popular choice for Preventive Maintenance on soot blower, blow-off, boiler feed, drip and drain lines. They're made for pressures up to 350 pounds at 550°. For 150 pound lines, specify No. 14½P.



CRANE

CRANE CO., GENERAL OFFICES:
836 S. MICHIGAN AVE., CHICAGO
VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

FOOD INDUSTRIES

DISTRIBUTION
PROCESSING

PUBLISHED
MONTHLY

A McGRAW-HILL PUBLICATION

M. A. WILLIAMSON
Publisher

LAURENCE V. BURTON
Editor

E. S. STATELER
Associate Editor, Chicago

G. L. MONTGOMERY
Associate Editor

IVAN C. MILLER
Distribution Editor

F. K. LAWLER
Managing Editor

R. S. McBRIDE, Washington, D. C.
PAUL WOOTON, Washington, D. C.
N. A. BOWERS, San Francisco, Cal.
S. T. HENRY, Spruce Pine, N. C.
EARLE MAULDIN, Atlanta, Ga.
ARTHUR S. ALLEN, Consulting Color Editor

Contents for SEPTEMBER 1940

VOLUME 12 • NUMBER 9

FOOD TECHNOLOGY

New Discoveries and Inventions

Food Technology
Dust Hazards 90
Aeration in Fermentation 90

Baking and Milling
Bleaching Flour 90
Alginates in Baking 90
Milk Bacteria in Bread 90
Erroneous Theory of Syneresis in Wheat Gluten 90

Cold Storage
Chemical Changes in Stored Apples 91

Beverages
Plum Juice 91
Beverage from Beets 92

Canning
Copper in Greened Vegetables 92
Citrus Fruit Juices 92

Dairy Products
Striking Ice Cream Mixes in the Pan 93
Propionic Acid Bacteria in Cheese 93
Alkalis for Cleaning Milk Equipment 94
Salt and Butter Quality 94
Condensing Milk Prevents Oxidized Flavor 94
Milk Films on Equipment 95

Fats and Oils
Fats and Oils Analysis Methods Recommended 95

Meats
Fat-meat Deterioration in Storage 95

Miscellaneous
Vitamin C in Tea 95
Preserving Coffee Aroma by Antioxidants 95
Pectin from Chicory Root 95
Quality of Vegetables 96

★HOMES OF FAMOUS FOODS

Shown on the cover of this issue is an important confectionery manufacturing plant in the Midwest. It is the big St. Louis factory of National Candy Co.

THIS MONTH

PROCESSING

The Tin Situation—How It Involves the Food Manufacturer ... 33
By L. V. Burton

The Real Issue in the Sweetener Controversy 36
By R. S. McBride

Plant Economies Engineered with Modern Conveyors 38
By G. L. Montgomery

Continuous Quick Freezer Developed by Birdseye 44

New Developments in Treatment of Milk Wastes 46
By L. F. Warrick

Blitzkrieg Handling Methods Adopted by Canadian Packer 49
By C. B. Cook

Food Plants Lag in Accident Prevention 52

Spice Oils Give Uniform Flavor 54
By Arthur H. Downey

DISTRIBUTION

How Foods Are Packed for Export 41
By Joseph Leeming

What the Public Thinks About Advertising and Loss-leaders .. 56
By Dickson Hartwell

Hints and Hurdles 58

New Packages and Products 59

Salesmen's Cars Dressed Up to Increase Sales 60

EVERY MONTH

Talk of the Industry 29
Automotive 60
The Food Industry News .. 62
Business Trends 71
Letters to the Editor 74
Men, Jobs and Companies 76
Catalogs 80
Food Equipment News 82
Food Technology—Abstracts 90
Books 97
Patents 98
Formulas for Foods 101

McGRAW-HILL PUBLISHING COMPANY, INC.

JAMES H. McGRAW, Founder and Honorary Chairman

Publication Offices: 99-129 North Broadway, Albany, N. Y. *Editorial and Executive Offices:* 330 West 42d Street, New York, N. Y.

Branch Offices, 520 North Michigan Ave., Chicago; 68 Post St., San Francisco; Aldwych House, Aldwych, London, W.C. 2; Washington; Philadelphia; Cleveland; Detroit; St. Louis; Boston; Atlanta, Ga.

JAMES H. McGRAW, JR., President
HOWARD EHRLICH, Executive Vice-President
MASON BRITTON, Vice-Chairman
B. R. PUTNAM, Treasurer
D. C. McGRAW, Secretary
J. E. BLACKBURN, JR., Director of Circulation

Published monthly; price 35c a copy. Allow at least ten days for a change of address. All communications about subscriptions should be addressed to the Director of Circulation, 330 West 42d Street, New York, N. Y. Subscription rates: United States, Canada, Mexico and Central and South American countries, $3 for one year, $4 for two years, $5 for three years. Great Britain and British possessions, 30 shillings for one year, 60 shillings for three years. All other countries, $5 a year, $10 for three years. Entered as second-class matter Aug. 17, 1936, at Post Office, Albany, N. Y., under the act of March 3, 1879. Cable address: "McGrawhill, N. Y." Member of A.B.P. Member of A.B.C. Contents indexed monthly in the Industrial Arts Index.

Copyright, 1940, by McGraw-Hill Publishing Company, Inc.

In THIS *Issue*

• ANYTHING TO IT?

You hear a lot of talk about a possible war-induced tin shortage in the United States. But what really is the situation? FOOD INDUSTRIES made a thorough study, checked and double-checked with those in the know and reports its findings in a series of articles, the first of which starts on page 33. You ought to read it, for if an "emergency" should necessitate restricting the use of tin, food men would face new problems.

• WHAT THE FIGHT'S ALL ABOUT

Food manufacturers are more than mere spectators of the trade fight between the producers of sweeteners, because they will be affected by the outcome. The row is over the proper way to declare sweetener ingredients on the food label. But the controversy involves fundamental questions about sweeteners. The problem, which must be decided by McNutt's FSA, is discussed on page 36.

• THERE'S A JOB TO BE DONE

Food manufacturers ought to tell consumers how little of the food dollar really goes for advertising expense, because the housewife is misinformed. This was discovered in a personal-interview survey of consumer opinion made for FOOD INDUSTRIES. This same survey revealed what consumers think of loss-leader selling—they aren't fooled by it. Turn to page 56.

• WHAT A NUISANCE!

Waste liquid products from all sorts of dairy products plants sometimes cause an intolerably insanitary condition if merely dumped on the ground. If allowed to pass into creeks or rivers, these wastes pollute the streams. If run into a sewer, the sewerage disposal system is soon overburdened. What to do? The Wisconsin State Board of Health started some years ago to investigate. Now they know. The story begins on page 46, told by L. F. Warrick, Wisconsin State Sanitary Engineer, who directed the work.

• TAKE ADVANTAGE OF PROGRESS

A little good engineering can give a plant full advantage of modern equipment designs. How one plant coordinated modern processing equipment with suitably chosen modern conveying equipment, and reaped the consequent savings, is told on page 38. How another plant coordinated new handling methods with old ones to considerable advantage is told on page 49.

In FORTHCOMING *Issues*

• LOOKING THROUGH FOODS

What food manufacturer wouldn't like to be sure that no package leaving his production line contains any foreign material that will cost him a customer or a law suit? A lot of manufacturers are making sure by looking through the sealed packages and their contents with the aid of X-ray machines. Others are using this tool to examine products for natural defects, such as puffiness, crystallization or frost damage in citrus fruits. The various aspects of quality control by X-ray inspection will be discussed in an article now in preparation.

• TEST OF CONSUMER TASTES

Nothing is more important to the food manufacturer than the taste quality of his products. And nothing is so difficult to determine as the particular flavor that will appeal to the greatest number of consumers. Which makes "must" reading a future article on how consumer preferences for pickles were tested and interpreted. The authors, R. G. Switzer and F. W. Fabian, Michigan Agricultural Experiment Station, got some enlightening results by varying the amount of sucrose and sucrose-dextrose combinations.

• NEWCOMER GROWS FAST

Not long ago, the soybean was a curiosity in American agriculture. Then it began to be planted as a soil-improving and fodder crop. Today, this crop is rapidly assuming a commanding position as a source of vegeable oil second only to cotton. What does this rapid growth mean and how will it affect the competition among the oils and fats? This question has recently been investigated for FOOD INDUSTRIES and the results of the investigation will be published soon.

• FOR THIRSTY PLANTS

Dairy products plants are great users of water; in fact, their operations depend upon a constant supply of requisite purity. This being true, these plants are in a fine position to profit from recent advances in water supplying equipment. Also, they are vitally interested in water supply conditions affecting availability. Both aspects of the problem will be covered in a forthcoming issue of FOOD INDUSTRIES.

FOOD INDUSTRIES
DISTRIBUTION • PROCESSING
Established 1928 — McGraw-Hill Publishing Company, Inc.
LAURENCE V. BURTON, Editor
Volume 12, Number 9 September 1940

The Talk of the Industry

» CANNED CRÊPES SUZETTE is one of the more recent entrants into the field of industrially processed foods. Alfonse Roart of Philadelphia is the discoverer of the art of canning pancakes. Yet, even though he has a patent on the process, in our opinion the important feature is that he has produced a product that will make any lover of crêpes Suzette smack his lips and cry for more. His accomplishment is based on the fact that he is an experienced French chef.

Just to substantiate our oft-repeated admonition that good tasting food is the fundamental basis for success in the food business, let it be recorded here that Mr. Roart has been doing all his manufacturing in his own home and, according to reports from Philadelphia, is making enough out of it to spend his winters fishing in Florida.

If you insist on being technical about it the preservative, alcohol, is in the form of rum and brandy. Naturally, such a product is expensive and is sold largely to what used to be known as the "carriage trade."

» The following letter, received by an equipment builder, serves to substantiate FOOD INDUSTRIES' repeated

claim that training in food technology must include a considerable amount of engineering.

—— —— Co.

Gentlemen:

We are shipping to you today by motor freight a pasteurizing vat which has been "blown up".

Please repair this vat immediately and return to us. The reason this vat blew up was because we had a home-made pop-off valve on it which did not "pop". The reason we had this home-made valve on was because the original pop-off valve seemed to be too weak for our sweet water pressure. Now if there is any way you can eliminate this hazard we will appreciate it very much.

» READERS who write to the editors should give their addresses if they wish to receive answers, especially when they are critical of something.

» FOR SOME important reading in these troubled days we suggest the following:

"The Enemy Within," by Captain Henry Landau, published in 1937 by G. P. Putnam's Sons, New York. This is the inside story of German sabotage in America prior to World War I. Less important, though more exciting, is his "All's Fair" (1934), which tells of his espionage work for Britain during the war.

"German Secret Service at Work," by Bernard Newman (Robert M. McBride & Co., New York, 1940) is also entertaining and informing for it shows how Germany has organized for sabotage in countries like the United States.

With the future looking more and more disquieting, we suggest such reading to those incorrigible optimists who still believe "it can't happen here." Whether or not you will be educated by such books, you will be greatly

entertained. And at the present moment, industrial sabotage is the thing to be prevented.

» THE SHORTNESS of the memory of men is notorious. For that reason it is very gratifying to read the useful pamphlet put out by the National Canners Association entitled, "The Canning Industry and Recent International and Domestic Political and Economic Developments."

It reviews the business history of the canning industry between 1913 and 1921, and records price and production trends in those years. Most surprising is the revelation that prices of many canned foods actually declined severely from 1913 until 1916, when the trend turned upwards. Nevertheless, there was a trifling price spurt just after the First World War began, but it was followed by the two-year decline.

Then came U. S. participation, huge demands, the Council of National Defense, The Food Administration, price control, allotments and ever-increasing demand—then Armistice. Next came demobilization, the problem of Army surpluses, and the decline of prices.

The pamphlet points out striking similarities between the price trends of 1914 and of 1939, but also emphasizes many other features and conditions that are different today.

It will be apparent to any reader that similar reports should be compiled by all trade associations and, should they become available, they should be carefully studied by all food manufacturers. Memory plays some mean tricks on us that could be avoided by a review of the recorded facts.

New Labor Schedules Needed

WITH Oct. 24 comes the end of the 42-hour week under the Wage-Hour law. From that date on, 40 hours per week is the maximum work period without overtime pay. Obviously this means a new problem for many labor superintendents and operating executives in the food business. A whole new set of schedules will have to be set up in many cases.

It will be far more necessary to watch minor overtime items than heretofore. Many employees who work nominally 40 hours could be allowed an occasional bit of overtime without risk of law violation during the 42-hour period. But from now on, even small overtimes may bring penalties. Control is a difficult job, but not one to be shirked.

Nothing Is So Costly As Failure

APPOINTMENT of Miss Harriet Elliott to be adviser on consumer protection on the National Defense Commission is a move based on good intentions. Perhaps it is merely a political gesture—a sort of sop to the unrealistic socially minded. But if this country is to have an adequate military establishment, everybody is going to pay, and pay dearly. It makes little real difference whether the payments go via the grocery store, the landlord, coal dealer or clothing store, or whether the payments are made by direct taxation. We, the consumers of the United States—130,000,000 of us—can, however, console ourselves with the knowledge that nothing is so costly as failure, especially a military failure.

The Enemy Within

CERTAIN important business executives lately have been astounded—nay, even flabbergasted, to discover that photostat copies of very confidential original reports and memoranda from their private files have found their way into the hands of competitors and sometimes thereafter into the hands of the Department of Justice, or Labor, or the Federal Trade Commission. So far, these documents have pertained to matters of competition or attempts to thwart CIO activities—all peacetime matters.

America is so accustomed to honor the honesty of employees, that we are apt to overlook the important fact that we are arming ourselves against a formidable opponent whose military strength is but a part of his equipment.

Need we say more?

Consumer Buying Power Rising

DESPITE fears that our superabundance of foods in the U. S. may have a depressing effect on prices, one should not lose sight of the fact that consumer buying power will increase every week as the defense program gets under way. This may be expected to lead to good markets in industrial areas affected by the defense program.

When we went into the last war the prices of foods were much higher than present levels. Hogs were $19.50, as compared with $6.00 to $7.00 now; wheat was then pegged at $2.20, but is now at about $0.70. Cotton was $0.22, compared with today's $0.08.

Labor is today getting more pay than it did for the same work during the first year of World War I. Hence labor should have more to spend after paying for necessities. While one does not look for a recurrence of silk shirts where blue denim would have been more appropriate, there will be many an astute sales manager of luxury goods who will be scheming to sell this improved market. It is to be hoped that food manufacturers do not overlook this potential opportunity.

Bricks Without Straw?

EVEN THOUGH the food industry does not produce airplanes, guns, tanks or battleships, it is obligatory on all of us to understand, and pass

Hors d'Oeuvres

• In 1814, Donkin, Hall and Gamble, London canners, received from Sir Joseph Banks, president of the Royal Society, this testimonial: "I know of no objection to my name being placed among the . . . names in your Prospectus, as giving their testimony in favour of the nutritious qualities of your embalmed Provisions." And Sir Joseph meant it as a compliment.

• *The life span of the halibut is about the same as for humans. The largest halibut are 40 to 60 years of age, or older. So the fish you had for lunch may have been around longer and traveled farther than you. Poor fish.*

• According to Chinese legend, people started drinking tea about 2737 B.C., or more than 36 centuries ago. Now the world's production of tea amounts to two billion pounds annually. The product didn't exactly skyrocket to success, but still and all it has built a rather respectable volume.

• *Dr. Karl T. Compton, president of M.I.T., observes that: "In the research that has not been done, America may have missed many a nylon, neoprene, polaroid or even an automobile industry." And food manufacturers no doubt have missed many a Coca-Cola, Shredded Wheat and Oh! Henry.*

• Made in New Jersey and on sale in New York are the juices of grass and alfalfa. Before long you may be eating Birds Eye quick frozen hay or Honor Brands fresh frosted Kentucky bluegrass.

• *The Prohibition party has been circulating petitions for a full slate of Presidential electors and candidates for Senator and Representatives at Large in New York State. Come another female tornado with an axe, and brewers and wine manufacturers may be making soda pop again.*

• Now that Elsie, the Borden bovine, has gone into the movies, a lot of the pretty young things are asking: "What's she got that we haven't got?" We wouldn't know.

• *Der Fuehrer, tender soul that he is, feels for the health of his countrymen. And for their own welfare he wants them to give up beer, their national beverage, and take to a non-alcoholic substitute. Oh, no! The grain shortage in Germany has nothing to do with it.*

• The building of a two-ocean Navy will aid meat packers. What's the connection between dreadnaughts and pigs? Well, in launching new ships enormous quantities of lard will be used to grease the ways.

• *Sardines are sold one at a time in China. Few people there can afford a whole can. Anyway, they don't lose their religion wrestling with a can opener.*

• If you chew enough raw meat you may develop an accessory set of "teeth" or bony tissue, says Dr. Hrdlicka, of the Smithsonian Institution. Eskimos and Greenlanders have done it. But in America we chew the fat and get our second set of teeth at the store.

F.K.L.

along to others who do not understand, the real truth about the scandalous delay in Washington over amortization of plants especially constructed to produce munitions. Ditto for the equally important matter of excess profit taxes.

Some labor leaders, some of our so-called statesmen and certain misinformed individuals see only greed for profits in the reluctance of manufacturers to build new factories for armaments until the matter of amortization and taxes is settled in advance of signing a contract. What these critical gentlemen do not understand, realize or admit—one does not know which—is that very few concerns have enough cash in reserve after seven years of futile Federal economic experimentation to finance the needed construction. One labor leader opposes conscription of men until capital is conscripted, forgetting or ignoring the fact that capital has been heavily conscripted by various New Deal experiments until only very few of the wealthiest concerns have any big cash reserves left.

Take that long-delayed order for 9,000 airplane engines which Packard Motor Car Co. had promised to accept if the amortization and tax measures were fixed in advance. There are some who aver that Packard has been unpatriotic in refusing to accept the order without these wise precautions—that Packard has been putting profits ahead of defense. Well, the fact is that Packard has not been able to pay a dividend for years, and has not enough cash available to finance a huge new airplane-engine plant. Packard's stock has not sold above $5 per share for many years—a fair index of Packard's cash position. If Packard is ever able to carry out the airplane-engine order, it must borrow a huge sum of money. Get it? Borrow about $30,000,000?

From whom shall it borrow? Banks? If so, what is the security? Bankers are compelled by law to lend only on adequate security, and they want their money back, not an assignment of an airplane-engine factory many times too big for peace-time needs. Shall Packard borrow from RFC? Well, Jesse Jones, the astute individual who heads RFC, is lending —not giving away—Federal money.

It all boils down to this: Defense measures are for the entire population of the United States, not merely for one group. Capital cannot be conscripted where it does not exist. Capital is nothing but the savings from the fruits of prior labor. Much of the capital of the United States has been frittered away, dissipated by a New Deal law that has forced imprudent payment of dividends by penalizing cash reserves above what some smart youths in Washington have considered proper.

Now that we face a national emergency in which nothing else but industry can build the necessary armaments, people are beginning to realize that this same industry is the one that has been lambasted, hamstrung and discouraged for the past seven years. If huge new aggregations of capital are needed for defense purposes—for construction of new plants; for airplanes, engines, guns, tanks, warships, etc.—then let us all realize that we, the people of the United States, must put up the cash for the reason that very few industries have the requisite amounts any more.

If you hear anyone shooting off his mouth about unpatriotic delays in starting production on armaments, it would not be amiss to remind him that the administration, especially the Treasury Department, has been more to blame than anyone else except Congress. What some folks desire of industry is akin to the biblical story of the Egyptian requiring the captive Jews to make bricks without straw.

Navy's Needs Hit Food Industry

WHAT APPEARS to be the fiirst impact of the armament program on the food industry has come about by the Navy's purchase of 12 of the best, newest and largest trawlers from the Boston fishing fleet. This will reduce the fishing capacity of the fleet by a material percentage—perhaps as much as 25 percent, but it will not necessarily reduce the catch of fish by any such figure.

Commercial fishing is a strange business from the economic and production viewpoint, though very picturesque to those who are not compelled to make a living by this hazardous occupation. With fewer and smaller boats now engaged in capturing fish, the individual boat catches may well be larger than formerly. It is barely possible that the landings at Boston will not be materially curtailed.

The trawler sale comes at the close of one of the longest and costliest fishermen's strike in the history of the industry. All of the fleet was tied up for over three months. The bone of contention was the right of individual boat captains instead of the owner companies to handle the selling of the fish, the unions apparently forgetting or being unaware of the fact that the larger the number of sellers in proportion to the buyers the lower the selling prices are likely to be. The strike was lost after a minor face-saving compromise.

Though the Navy's purchase of the biggest ships was merely a coincidence with the end of the strike, there is grim irony in its effect, for it will be extremely difficult for the fishing companies to replace these ships for a long time to come. A very considerable number of fishing jobs are probably gone for an equal time.

Dangerous Years in Research

WHEN a concern embarks on any sort of research program, the psychological effect on the executives usually follows the same pattern. At first the new research program is a matter of corporate pride, but this pride lasts seldom more than 18 months.

At the end of a year and a half, the executives are acutely conscious of the expense of the research department and are beginning to bemoan its cost. Their regrets are understandable because it is seldom that a newly organized research department begins to show tangible results until a matter of years has elapsed. They are acutely conscious of expense but not of benefit.

Another change of heart toward research usually occurs about three years after the program has been started. By the end of the third year the research organization has begun to show results that can be measured on the profit side of the books. And after the profits begin to appear, the company executives realize that they cannot get along without research.

Those first three years are the hardest, and management should realize that they themselves, just as much as the research function, are on trial.

Stout hearts, patient dollars and persistence win in the end.

Tie Score In Nonsense Handicap

THE FOOD and Drug Administration rules tentatively that apple butter made from dried apples must be labeled "dried apple butter". They admit officially that they can't tell the difference between it and the product made from fresh apples. They have before them convincing evidence that the product from dried apples is more uniform throughout the year, and that it is made much more economically. Both of these things are in the public interest. Yet they rule that the label must be such as will virtually prevent effective marketing. For certainly even zealous food inspectors must know that Mrs. Housewife will not buy "dried apple butter".

(Is it dried apple-butter or dried-apple butter?) Score one for silliness in official Washington.

Now come the manufacturers of dried skim milk, with their contribution to the silly symphony. In all seriousness they insist that the word "skim" must be taken off their labels. They propose the mouth-filling name "milk solids not fat" and they say that this is the common or usual name. At least their appeal must be interpreted as making this latter claim since they want to use the laborious phrase on labels. Score one for the manufacturers.

No one knows how many scores there would be if the records and proceedings were studied. But one can be sure that the score would be big against both over-zealous officials and over-sensitive manufacturers who act as if they were ashamed of their products. There is no justification for either attitude. Both are a serious handicap to the food industries.

Complexities Difficult to Unravel

To hear Dr. C. S. Pederson of the New York Agricultural Experiment Station relate his long researches on sauerkraut fermentation affords this department much satisfaction. Before the first World War we had ruined many tons of perfectly good cabbage in an effort to learn how to produce either (1) a quicker fermentation or (2) a better fermentation. All that we succeeded in doing in two years of experimentation was to demonstrate that anything attempted in the way of pure culture inoculation was sure to produce worse—not better—sauerkraut. Management then wisely decided to let the kraut fermentation alone.

Well, after hearing Dr. Pederson, we feel much better about our failure to produce an epoch-making discovery. For he had to keep at his researches for over twenty years before he began to unravel the complexities of the kraut fermentation. After 25 years of study he finally solved most of the mystery. There are two separate fermentations that must succeed each other in the proper sequence or the kraut is very poor.

The first fermentation produces the quality desired but fails to produce the conditions that actually preserve. The second has no effect on quality but runs up the acid to the point of good preservation. If the second or preserving fermentation gets started first, the resulting product is merely preserved cabbage. It could never be called sauerkraut. On the other hand, if the preserving fermentation fails to materialize, the kraut won't keep. All our own efforts had evidently been on the second fermentation.

Then there is a third fermentation phase that sometimes develops, the exact function of which is not wholly certain.

We feel much better about it, now that even after 25 years of continuous study there are still a few loose ends to be chased down.

What We Have Learned About Formulas

As a result of eight months' experience with the publication of formulas, we have learned some interesting things:

1. The ordinary person will not pay more than the cost of a postage stamp for a formula.
2. The average person has no imagination or ideas about foods or formulas.
3. The average person has only one cook book in his own home, and if that cook book is no good, he has no intention of spending a few dollars for several good ones in order to study up elementary formulas such as a housewife might use.
4. The average male has less than one-tenth of the gumption and persistence of a woman who knows how to cook when it comes to adapting known information to his needs.
5. A large collection of cook books is a valuable asset.

Best Cop on the Beat

Some police officers seem to think that the more folks they arrest the better public servants they are. Any experienced and wise official knows that such a philosophy is very bad. It is bad for the public. It is bad for the police department. And it prevents any measure of cooperation between the two.

Now come the executives of the Food and Drug Administration demonstrating that they, too, are wise in their handling of the culprits caught on their beat. We refer to the wicked goods that are guilty of being adulterated or misbranded, and the folks that make and ship them. When these goods culprits are caught they are seized, and a libel proceeding in the court determines whether they shall be destroyed (if they are dangerous), given to charity (if they are merely misbranded, but wholesome) or returned to the owner for relabeling or repacking (if the fault appears to have been unintentional, and correction by the owner seems equitable). After this handling of the goods and their disposal or release comes the question of guilt of individuals and companies. There is where a wise cooperation is being developed.

The executives of the F&DA confer with their attorneys, after the goods action is settled, to see whether some criminal procedure is appropriate. The purpose of such action is to secure observance of the law, not merely to punish somebody. The fairness of the decisions made seems to be well evidenced by the extent to which guilty pleas are entered when it seems necessary to have such criminal action. Very few cases go to formal trial. This is all as it should be. It evidences a fair but vigorous intent to enforce the law. It shows that there is no more harsh punitive purpose among officials.

Some folks outside the food industries have not understood this. It will be well for such critics to look over such actual happenings and see whether they do not think that the food "cops" are doing a good job of getting cooperation and observance of law. It looks to us as though they were.

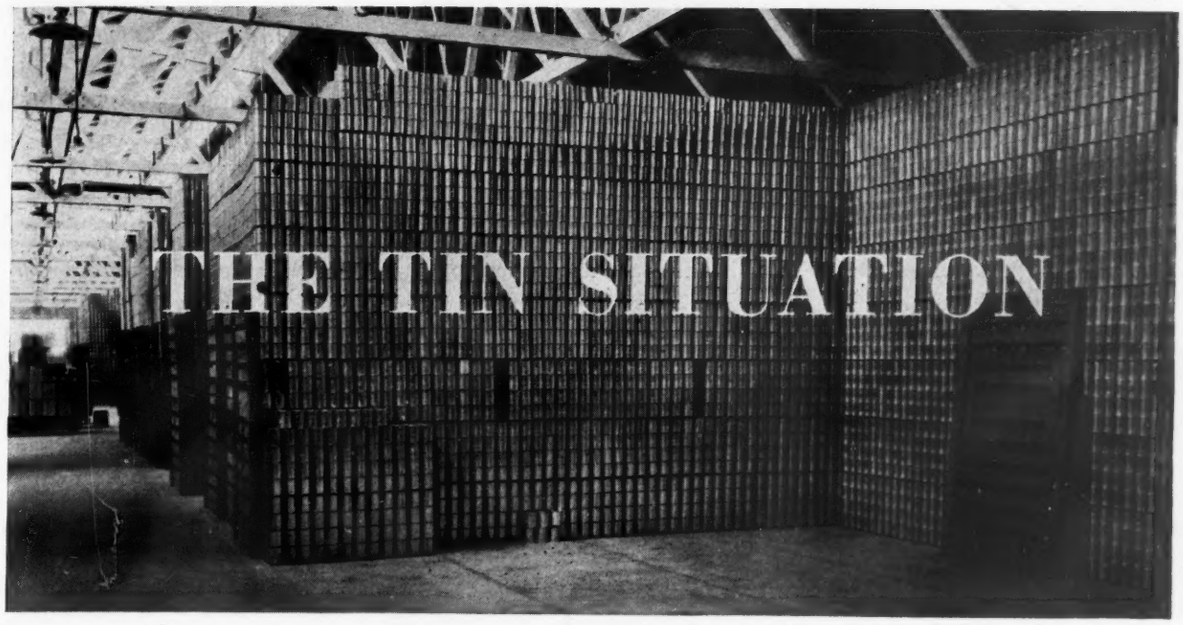
Trimmings, Peelings or Scrap?

Some branches of the food industry ought to learn some of the nicer sounding synonyms for the words "trimmings" and "peelings". Trimmings, strictly speaking, are usually added to something else for purely decorative purposes. Nevertheless, the unabridged dictionary also gives another meaning that is almost exactly the opposite of the foregoing, and indicates that "trimmings" also means bits or fragments that are removed by trimming.

Peelings are superficial parts that are removed to get rid of them. In theory, at least, the peeling is undesirable. But suppose a considerable proportion of the underlying material is also removed in the peeling operation. Is the desirable material also peeling or is it something else?

To our quaint way of thinking, the material removed might more properly be called "scrap," and, if it can be recovered, is as suitable for use in food manufacturing as pieces of dough which the baker trims from pies or the scrap left from cutting biscuits, macaroni or candy.

Before any such niceties of language will be of material aid in promulgating the food standards, it will probably be necessary for the industry to learn the use of the word "scrap" in its proper sense and not speak carelessly about trimmings or peelings when actually scrap is what is meant.



With many millions of containers being used in the food industry every year, any significant change in tin supplies will be felt by the industry. Tin is used in cans, in closures, and in metal ends for cartons.

How It Involves The Food Manufacturer

Should an "emergency" necessitate restricting the use of tin, food men will face new problems

By L. V. BURTON
Editor, FOOD INDUSTRIES

ANY VISITOR at the planning division of the Army Industrial College in Washington can plainly see on the walls a list of what are termed critical and strategic materials. They are printed in letters six inches high. If the list interests you the War Department will obligingly present you with a mimeographed copy of the items.

For practical purposes a strategic material is one which is indispensable for the functioning of our country, especially in a war, and cannot be obtained in sufficient quantity within the borders of the United States. On this list are tin and rubber, both of vital importance to the food manufacturer. Also there are many other materials such as manganese, tungsten, antimony and mercury without which we would be in a serious way if the nation were at war or if we are to avoid being greatly handicapped in time of peace.

Yet despite the widespread publicity which has been given to this list of indispensable materials during the past two years, it is doubtful if more than one food manufacturer in fifty realizes its possible significance to his own business.

In the United States we have been so long accustomed to getting what we want, when we want it, that it is almost incredible that anything we may need could ever be unobtainable. Ask any food manufacturer what he plans to do in case tin becomes scarce, and nine times out of ten he will look a little puzzled and say, "Oh, I guess that won't ever happen." It won't ever happen if the Army and Navy Munitions Board and the National Defense Advisory Commission can have their way and succeed in carrying out their plans.

Let me state emphatically at this point that in examining the subject of the importance of tin to food manufacturers I am not attempting to raise any alarms, nor am I advocating any changes in our ways of manufacturing or packaging foods. All that I am attempting to do is to lay the bare facts before the entire food industry and urge that each manufacturer and his key men study them. If, unhappily, tin should ever be hard to get, many

It Can't Happen Here?

Probably it won't happen here. But it might. And if it does, then the more you know about the tin situation the better. A lot of screwy ideas about tin have been in the daily press of late. This is an attempt to get at the cold facts. All food people should read it.

will be faced with problems that will require long and careful planning if they are to be solved properly, promptly and economically. The government is doing its utmost to build up ample stocks of tin until this commodity can be removed from the list of strategic materials. But it will still require some time before the reserve amount of pig tin in the United States can be accumulated to the point where we can say definitely that we are "out of the woods." In mid-August there was about a six-month supply of tin in the country, and another three-month supply enroute to the U.S.—an unusually large amount to be actually on the water.

TIN is used in a surprisingly large number of branches of the food industry, as well as in many other industries. Its use in tin cans is, of course, well known to all. Tin plate is vital to the canning of fruits, vegetables, fish and meat as conducted today. Tin cans are also largely used for beer, sirups, vegetables oils, coffee, tea and nuts. Tin boxes and slip-cover cans are used for biscuits, crackers, cookies, confectionery.

The dairy industry could not operate without the 40-qt. milk cans for assembling milk from farms. These cans are still made from tin plate, though stainless steel cans are available. And many a farmer's milk pail is coated with tin, though stainless steel pails are coming into considerable use. Ice cream is, on the other hand, now largely delivered in paper containers. (Copper vacuum pans for evaporating milk once had block tin linings, but the tin came off and is no longer used. Stainless steel is rapidly replacing copper for such pans, however. And practically all of the older tin-coated fluid milk processing equipment has been replaced with stainless steels.)

Bakers of pies and bread both use huge numbers of tinned baking pans. Nearly all copper steam-jacketed kettles used in the condiment trade have, or once had, tin linings that are either block tin or washed tin.

About 80 percent of the closures for glass food containers are made from tin plate, whether the closures be for beer, ginger ale, carbonated beverages, preserves, jellies or fruit butters; for glasspacked fruits, vegetables or meats; or for condiments such as mayonnaise, mustard, relishes, pickles, catchup or chili sauce. You will find metal ends on many cylindrical cartons for dry food products and generally the metal is tin plate. Nearly all baking powder is packaged in tin cans.

Oatmeal for export is also densely compressed and shoved into tin cans.

Cocoa, mustard flour and many spices are packaged in fiber containers with ends made from tin plate. Even the spouts on paper cans for salt are made from tin plate. Grated cheese is usually packaged in tin containers.

The meat packer uses a considerable amount of heavily tinned equipment in the plant in addition to the cans for a part of his products, such as lard and canned meats. And, of course, the maker of vegetable shortenings is a big user of tin containers. Only the flour miller, the maker of packaged cereals, the macaroni manufacturer and the flavoring extract manufacturer seem to be free from the necessity of considering what tin means to them.

Practically every other branch of the food industry uses tin in varying amounts, and is vitally concerned with the success of the government's plan to accumulate ample reserve stocks of tin.

Is it any wonder then that the United States uses annually from one-third to one-half of the entire world production of tin? Or that tin is a vitally necessary material?

OUT of our annual peace-time consumption of tin, averaging about 67,000 tons, we produce less than 0.2 percent domestically. A couple of hundred tons come from Alaska. We get a little more from Africa. Most of our supply comes from British and Dutch sources in the Malay Peninsula and the Dutch East Indies. Bolivia has a considerable tin ore producing capacity, but its ore contains certain impurities that without special treatment render it unavailable for tin plate making under highly competitive peace-time conditions, though Bolivian tin can be used for solder. Notwithstanding the fact that Bolivian tin can be purified, arrangements between mine owners and foreign smelters preclude shipment of Bolivian tin concentrates to the U.S. under normal conditions.

Of the total pig tin consumed in the United States the following percentages went into tin plate:

1935	.....41.7	1937	.....43.5
1936	.....40.6	1938	.....40.4

and the following percentages went into solder:

1935	.....23.4	1937	.....22.0
1936	.....22.6	1938	.....22.0

But, of course, not all the tin plate nor all the solder goes into the food industry. Tin plate goes into cans for oil, paint, varnish, tobacco, shoe polish, tin roofs and a host of non-food uses. And solder has a great many uses other than in food containers, notably in the automobile industry.

Present Status of Tin Stocks

In mid-July there was enough tin in the United States, or enroute for about seven months, figuring each month as one-twelfth of a year's average need. This explanation is necessary because the demand for tin during the season for making packers' cans is greater than in the off season. In the Far East there were said to be about 3,000 tons of pig tin that had not been shipped. In mid-August the supply actually in the country has been reported to be a six-month supply. Other sources say it is 50,000 tons—nearly a year's supply.

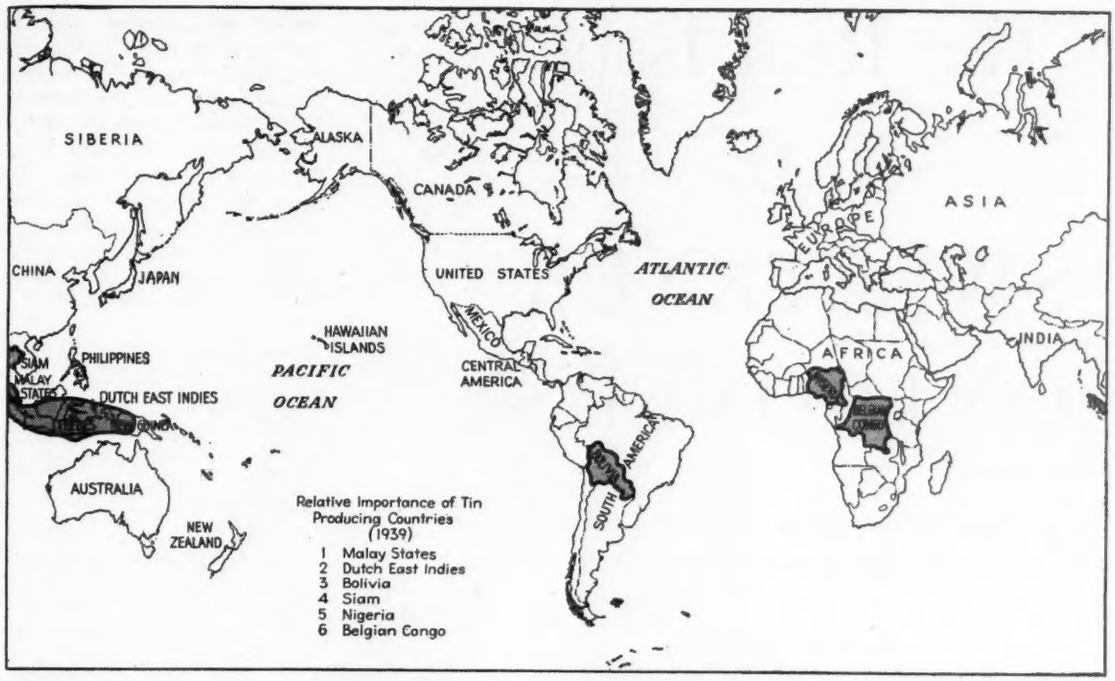
The U.S. supply that is calculated to last six months is, however, only an average figure. Some of the large tin-plate mills have on hand about a year's supply, which means that users of tin for other purposes must have much less of it on hand.

From the viewpoint of national defense, the current average figure of a six-month supply is the one that is being watched in Washington, for in a vital "emergency", with Far East supplies cut off, it might be necessary to ration tin with exceeding care; and privately owned stocks might even have to be used for other purposes than the owners had intended.

To comprehend why it is not easy to accumulate a huge reserve inside the country, it is necessary to understand the workings of the International Tin Committee, a cartel, which is not in any way subject to U.S. anti-trust laws. The Bolivian, Dutch and British owners of tin mines and smelters control their production in such a way that if the world price of tin begins to fall they produce less. If it goes up they produce more.

IF tin consumers in the United States were to start to build up private stocks of tin and cease buying, the market would begin to soften. And as a result the cartel would reduce the quota. We cannot compel other nations to sell us unless they choose to do so. On account of this fact there never have been any authentic reports of large private accumulation of tin in the United States. And since the cartel has been in existence, beginning Jan. 1, 1937, there have been no bargain prices that would induce private buyers to lay up huge reserves.

In order to get what we believe is going to be an adequate reserve supply of tin, the U.S. government has recently agreed with the International



World map showing where principal supplies of tin ore are produced. Note proximity of Japan to the Dutch East Indies, a main source of supply for the United States. Bolivia also has tin ore that can be shipped to the United States in an "emergency," but it contains impurities and will cost more to refine.

Tin Committee to buy up to 75,000 tons of tin in the year beginning July 1, 1940, at a minimum price of $0.50 per pound with the important proviso that the I.T.C. is to increase the production quota to 130 percent, and that the U.S. will hold the tin for three years in the absence of any emergency. Payment is to be made immediately on delivery into the U.S. This price is entirely satisfactory to the cartel, and if you read the newspapers along about July 8 you may have observed an unexplained statement from London to the effect that the cartel had raised the production quota to 130 percent. This merely meant that, having received a guarantee of a minimum price of $0.50 per pound in U.S. currency, the cartel is willing to produce all it can. In popular language, the lid is off; but only the naive expect 130 percent production all around.

THE pegged tin price would be very satisfactory to the cartel even with the currencies at par, but with depreciated foreign currencies, the profit to the producers is very generous.

With the foregoing arrangement in effect, one might possibly believe that tin could no longer be a problem of national defense, but that would be an error. The tin is not here yet. We had only an average of a six-month supply on hand in August. And there is no guarantee that the seas will always be free to ships to bring it here. Nor is there any guarantee that some hostile power might not interfere with tin production in the Dutch East Indies or Malaya or with its transportation to the United States. Perhaps this is one of the reasons why the U.S. fleet remains in the Pacific.

THE next step being taken by the government and the National Defense Commission is to try to work out a plan whereby Bolivian tin ore or concentrates can be brought to the United States instead of being shipped to Liverpool under the present arrangement and thence as pig tin to the United States. Bolivian tin could be used to replace tin from the Far East in solder making, or it could be refined electrolytically for tin-plate manufacture. But this plan is far from consummation and requires much negotiation. If it becomes effective we can count on a possible 40,000 tons of tin a year from Bolivia.

There are a lot of "ifs" in the tin situation. If we can build up a reserve of 75,000 tons of extra tin inside the country we will feel a lot more secure about this strategic material.

If all goes well and if there is no foreign interference, we shall probably have our tin *reserves* up to the safe point by the middle or end of next year. Much will depend on the outcome of the Battle of England. If the British fleet still controls the seas, we shall get our tin reserve in time. If the British lose the war, we may get the Far East tin; and again we may not. Nobody can guarantee anything in these days of sudden shift and change.

Presumably we shall be able to buy tin ores from Bolivia to be smelted in the United States in case the British lose the war and the seas may no longer be free to us, for in that event the Bolivian tin ore would not be shipped to England. But if we got the entire Bolivian production, it would be about half our actual peacetime needs. Bolivian production has already been greatly increased, but it cannot be easily stepped up further because of the scarcity of local labor —an aftermath of the Chaco war a few years ago which at that time seemed to be of very little importance to us. The extremely high altitude of the Bolivian mines (above 14,000 ft.) is also a deterring factor.

In another month or two, unless this rapidly changing world situation clears up or unless the tin reserve problem is wholly solved, further discussions will be presented. Next time the matter of possible substitutes for tin will be reviewed. A great many persons think that synthetic resins can be used in place of tin. Which is true. The important thing to remember, however, is that the uses of tin as we now know them represent the most economic method now known. But the substitutes are generally available —at a price.

The Real Issue In the SWEETENER CONTROVERSY

The problem to be settled by FSA is obscured by many arguments that do not relate to the basic issue

By R. S. McBRIDE
Consulting Chemical Engineer, Washington, D. C.

THE controversy over standards of identity and labeling requirements for food finds no more bitter issue than the ones which surround the question of sweetening agents. The sugar refining interests are undertaking to defend their position. They are being attacked by commercial competitors of several sorts, including those making liquid sugar, sugar sirups and the corn carbohydrates.

A great commotion and much confusion has developed. Many food manufacturers are being disturbed by this controversy. This article undertakes to simplify the issue down to its fundamentals. It is intended to be wholly nonpartisan in the controversy. Whether it is that or not, the primary benefit will come if it clarfies the thinking of the many food manufacturers who must understand this question as they plan their own purchases of sweetening agents or revise their present food formulas.

There are several carbohydrates that are more or less equivalent in their usefulness for food sweetening. Sucrose, the cane sugar and beet sugar of commerce, is of course the most important. Several variations of sucrose are now being offered. Liquid sugar and other sugar sirups are most prominent in this group. Some of these are purified from raw or second-grade sugars. Others represent practically an ordinary sugar sirup. Also there are the invert sirups, which represent the product of partial or total inversion of sucrose.

The corn carbohydrates form the second major group of competitive sweeteners. These are marketed partly as dextrose or dextrose hydrate, which are the two forms of refined corn sugar sold for food making. Ordinary "corn sugar" is a technical grade not offered for food manufacture. Also this corn group includes corn sirup in either the ordinary liquid form or in the form of crystalline dry material that is commonly sold as "corn sirup solids." This is nothing but corn sirup with the water removed.

It is almost precisely true to say that all of these carbohydrates from cane sugar to corn sirup are absolutely wholesome digestible foods when properly made. The food value of all of these sugars is almost the same, if one compares them on the basis of their dry weight, taking account of the slight variations in the contained water of constitution as well as the free water present. Stroud Jordan has given an excellent interpretation recently in FOOD INDUSTRIES (March, 1940, page 45) of the way in which these sugars should be compared as to their food value. No one can deny that they are all wholesome and equal within the limits of proper weight comparison. All are safe ingredients of any manufactured food so far as the diet of the consumer is concerned.

In contrast with these wholesome sweeteners which compete for a place in manufactured foods there are two other sorts of possible sweetening agents. First, there is a group of sugars chemically identical in composition with levulose and dextrose—mannose, for example. But dietetically they are not equally acceptable sugars and are not commercially marketed for food uses. If used, a pound of mannose would contribute almost exactly the same number of calories to a food in which it were put as does dextrose or levulose. But no one thinks of putting it there. It represents a kind of sugar that should not be considered as part of any food formula.

Second, there is the chemical sweetening agent, saccharin. That compound could contribute great sweetness but is without food value. When it is present it gives a very deceptive character to the food. Because of its great sweetness it makes it seem as though there were a great deal of valuable digestible sugar present. It can be used within limits for certain imitation products. But no sensible food manufacturer thinks of putting it in merely as a substitute for sugar, or dextrose, or corn sirup.

The Food and Drug Administration officials and their supervisors, the executives of FSA, thus find three possibilities:

1. They find equally wholesome, equally nourishing sweeteners competing commercially. There is no reason why these should not be used in the quantities desired by food manufacturers for the making of wholesome compounded foods.

2. This group of wholesome sweeteners *might* compete with less wholesome sugars. The latter could contribute to calories, but would not add properly to food value. They are not used, because they are not proper food sugars as are all those others now used. If anybody proposed to

Sugars Affect Your Business

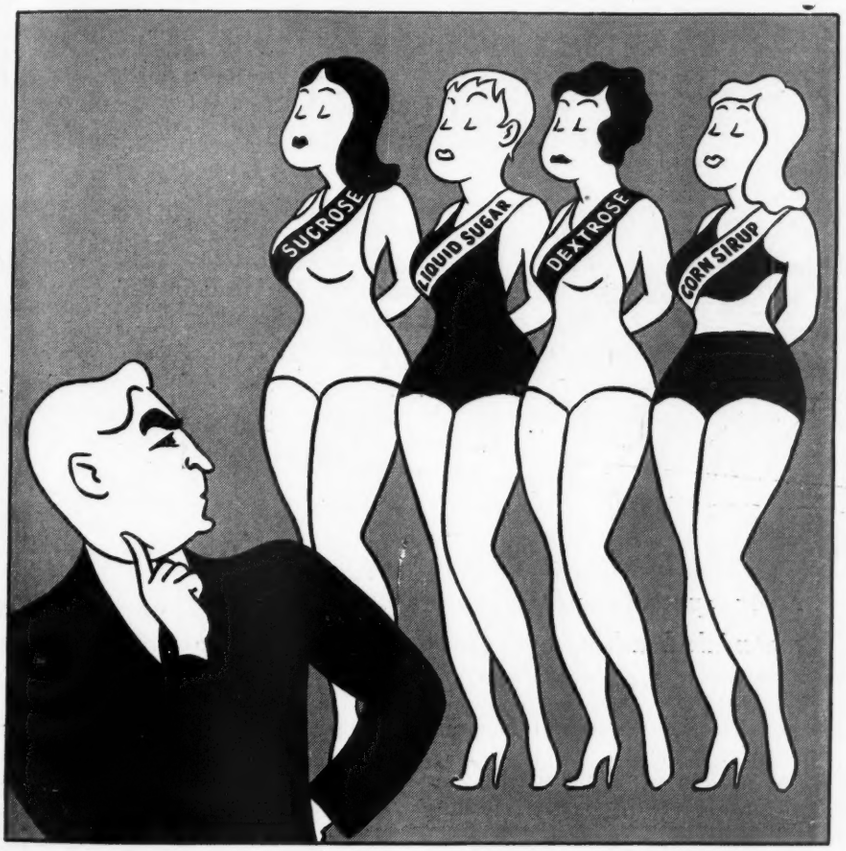
The real issue in the battle of the sweeteners is a trade fight.

Nearly everyone in the food industry has an active interest in the long drawn out row over the proper way to declare sweetener ingredients on the label.

Don't overlook the fundamental questions about sweeteners. These are the real factors in the problem. They are easy to state, but FSA has a tough job ahead to settle the row so that it will stay put, for the adversaries are powerful and resourceful.—The Editors.

use one there probably would be prompt ruling to forbid its becoming an ingredient of foods or beverages.

3. Saccharin can, and occasionally does, compete with the sweeteners having food value, but this competition is controlled by special label requirements. The presence of that component might become very deceptive in its effect on the purchaser, though not dangerous to health. Officials, therefore, permit it, but very naturally rule that the presence of that ingredient must be declared. Products which contain it must be labeled "imitation."



The real issue in the contest between the wholesome sweeteners is not one of relative propriety but one of label declaration. Paul V. McNutt's FSA is the judge in this contest of the sweeteners.

Up to this point there is very general acceptance of the proper interpretation of the sweetener competition. But just at this point sharp controversy begins as to the significance of the battle among the wholesome digestible food-value sweeteners. The competition has as its prime purpose the establishment for each competing material the most favorable trade relationship which can be set up by its proponents. That is proper and natural. But the result is much confusion as to the real meaning of the competition from the standpoint of the food manufacturer himself.

Actually the real issue between these wholesome sweeteners is one of label declaration, and not one of relative propriety as ingredients of foods. It is important that the food manufacturer know this and that public officials in their effort to make for the proper protection of the public realize that they are confronted *only* with the label issue. They are not really confronted with any question as to whether one or several of these sugars can properly be used in ice cream, carbonated beverages, bread or the other compounded foods.

The issue regarding labeling is in itself comparatively simple. It is obscured by much controversy, many warranted ideas and many more still of unwarranted claims. Unfortunately the issue has been more involved in political controversy than in fact finding. The issue in each case in its simplest terms is about this: When something other than sucrose is used, shall the other sweetener which is wholesome be declared on the label?

To answer that question is the job of FSA, with the technical advice of the Food and Drug Administration. The decision will be, and should be, based on the public interest. Political considerations will enter but obviously should not govern. A simple statement really clarifies the argument pro and con at that stage. This is about the way it goes, perhaps a little over-simplified, but essentially a true picture:

1. In favor of label declaration is the desire to give the maximum information to the consumers of the goods containing mixed wholesome sugars.

2. Opposed to the requirement of such label declaration is a psychological argument about like this: If one labels a container with an indication of the new sweeteners contained, this implies an inferiority in the whole product, even when no real inferiority exists.

This simplification of the issue is not complete, nor always accepted. For example, some of those who demand label declaration say that when sweetness is less than with sucrose there must be label declaration "to warn the customer." In reply, the food manufacturers say something like this: "We put in dextrose instead of sucrose because our customers want less sweetness with no loss of food value." This really puts the issue back on the over-simplified basis above.

Apparently Mr. McNutt, as FSA administrator, is going to have to decide whether more information to the consumer, which some people think necessary, is so important as to make necessary the risk which other folks claim would be incurred from excessive label declaration. That risk is the danger that progress toward modified sweeteners or sweetener mixtures will be hampered. It is a trade issue in its essence. But the public concern with the issue is perhaps the one that is most important for the governing of the decision.

As FSA takes up its hearings on this issue, by renewal of the canned peach standards case, it is evident that the sugar refiners and beet sugar makers have the support of some food manufacturers. But these are violently criticized by other food company men, who say: "We manufacturers should have the right to decide what sweetener to use in our goods. We take the risk of having to sell the product so made, and we should not be handicapped in selling such wholesome product by a label which implies that it is inferior."

However one views the case, it is going to be a hot battle—and an important decision for Mr. McNutt's first big case.

Plant Economies Engineered with MODERN CONVEYORS

By G. L. MONTGOMERY
Associate Editor, FOOD INDUSTRIES

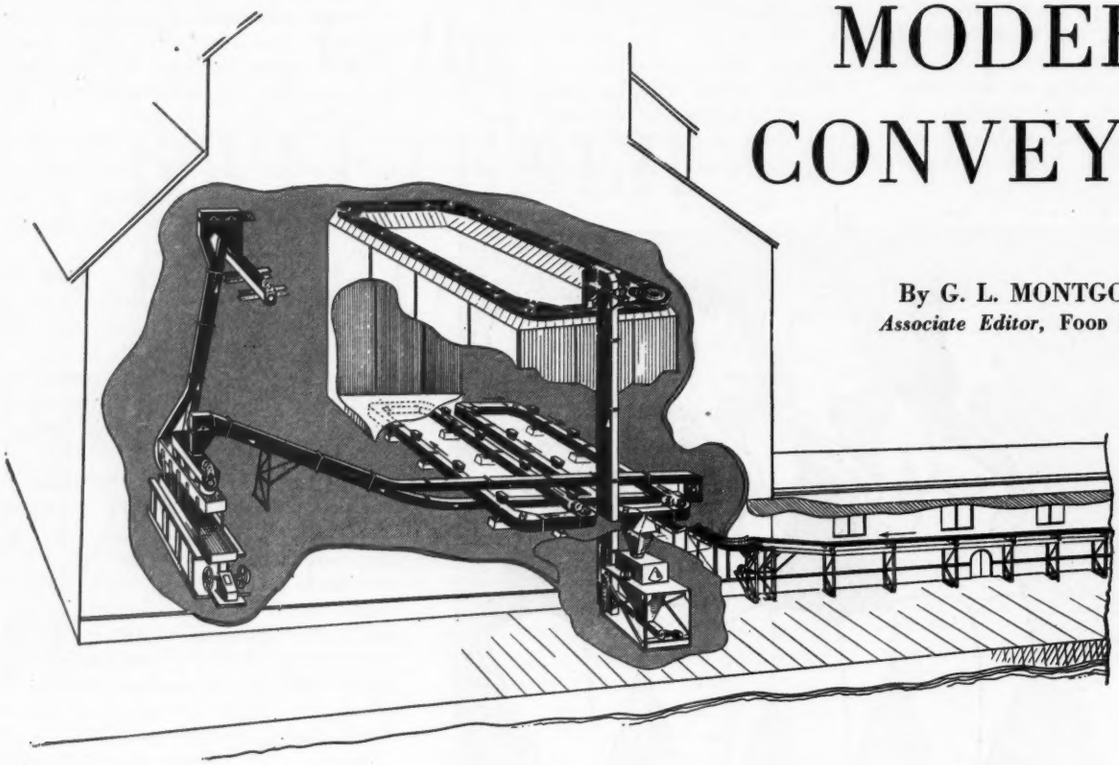


Fig. 3 — Diagrammatic layout of the principal conveyors in Sucrest sugar refinery

Floor space, operating cost and maintenance saved when materials handling and processing equipment are coordinated

STARTING from scratch is the ideal way to design any food processing plant, and permits the designer to realize to the full the economies that come from selection of processing methods and equipment most suitable for the operations to be carried out. Unfortunately, this can only be done in a new plant unless the savings to be made are sufficient to pay for altering and re-equipping an existing installation. To judge whether or not this latter course would be justified, it is well to study in some detail the newer plants, where full advantage has been taken of modern methods and equipment.

One of the greatest advances made in the food industries in recent years has been in the selection and layout of materials handling equipment. Economies in building space, in power requirements, in operating labor and in maintenance costs follow shrewd use of modern handling equipment. This can be well illustrated by considering the handling layout of the Sucrest Corporation, a modern sugar refinery on the Brooklyn, N. Y., waterfront.

In refining sugar this plant employs a modern process in which much building space is saved as compared with preceding refining methods and in which fewer pieces of equipment are required. Starting with this initial advantage, the company undertook to select such materials handling equipment as would give their plant the greatest economy of space and operating cost.

The nature of the product to be handled is, of course, the first consideration in the selection of materials handling equipment. In this sugar refinery only two states of dry material need be moved by materials handling equipment, as at other times the product, being liquid, flows. These two states are raw sugar in bags from the hold of a ship and granular bulk sugars—raw, moist semi-refined (or centrifugal) and refined sugar.

Handling the first of these materials —bagged, raw material—has been fairly well standardized for most refineries, as the problem is in general the same. Briefly, the raw cane sugar used in the United States originates mostly in the Caribbean area or the Hawaiian and Phillippine Islands and is brought to the mainland in ships, packed in bags weighing from 100 to 325 lb. These bags are unloaded in slings from the ship onto trailers that are hauled by gasoline tractors on the pier. The tractors haul the bags into a warehouse where a portable bag stacker places them in piles.

Raw sugar varies in condition with the temperature and humidity. In cold weather it forms a solid lump within each bag, while in summer it is a soft, sticky mass. These facts

This article on
MATERIALS HANDLING
contains suggestions for
All Food Manufacturers

Because it emphasizes the benefits in space saving, and lowered operating and maintenance costs, that come from the selection of materials handling equipment that can be coordinated with the processing equipment into a compact and economical plant layout.

—The Editors

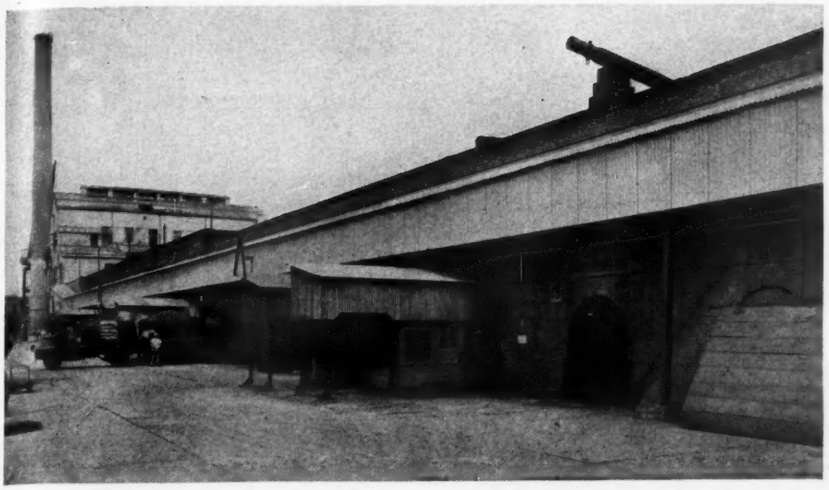


Fig. 1—Raw sugar warehouse of Sucrest Corp., Brooklyn, N. Y., with sugar refinery in the background at left. Note the covered conveyor along the warehouse wall for taking bags of raw sugar to the bag-opening department in the refinery

Fig 4—The run-around Redler conveyor for placing raw sugar in bin has no bottom plate, the sugar pile itself serving this purpose

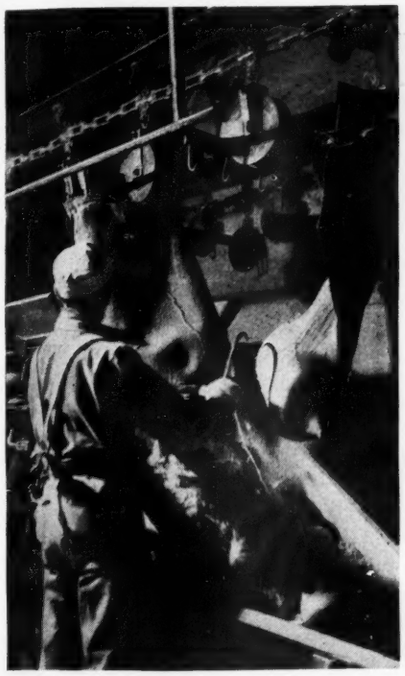
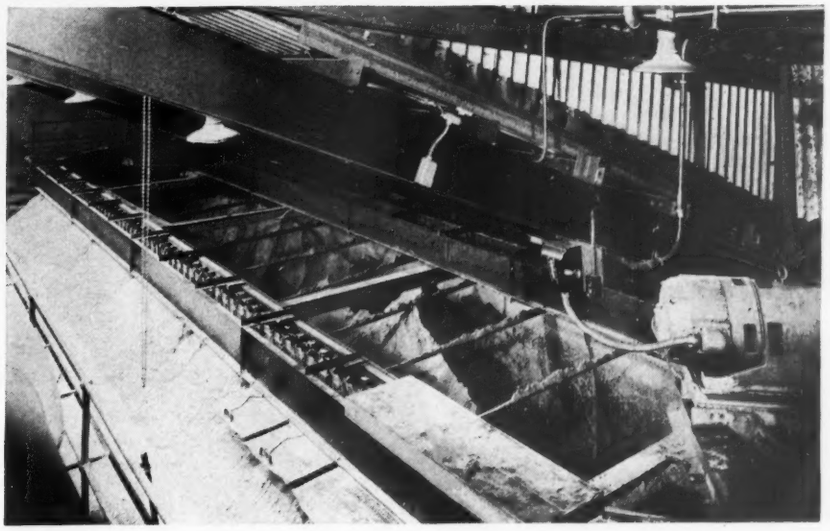


Fig. 2—Sugar bags are cut open on a short length of belt conveyor at the left then the three-pronged hooks on the chain trolley hold the bags during dumping and move the empty bags away



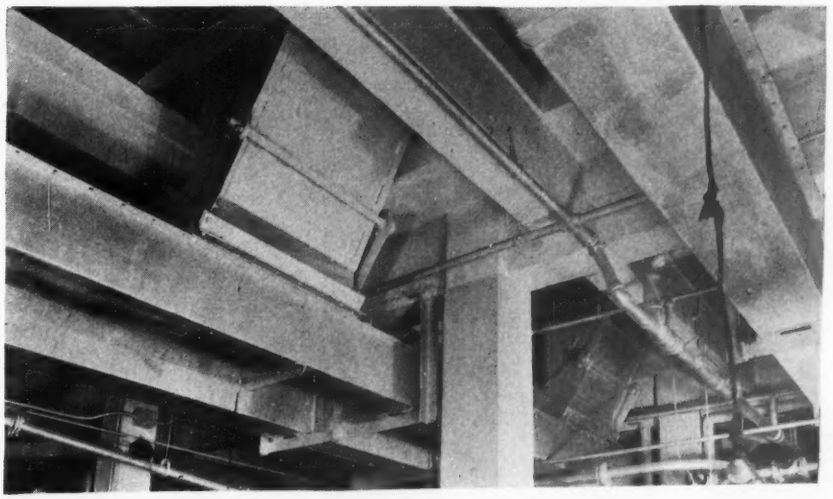


Fig 5—Underneath the raw sugar bin, two run-around Redler conveyors reclaim the sugar and deliver it to a combined horizontal-inclined Redler which elevates it to the top floor of the refinery

must be taken into account in the selection of the conveying equipment for handling the raw sugar, both in the bags and after removal from the bags.

At Sucrest the raw sugar warehouse, shown in Fig. 1, is on the pier. This makes possible quick and economical unloading of the sugar boats, as the tractors have only a short haul to place the bags on the desired pile.

Inclined portable belt conveyors are used for reclaiming the bags of raw sugar from the warehouse piles. These deliver through openings in the warehouse wall to a belt conveyor fastened to the outside of the wall. This conveyor, a 30 in. flat belt, is shown in Fig. 1 in the sheet metal housing along the warehouse wall. This belt discharges onto a scale conveyor, where the bags of raw sugar are weighed. From the scale conveyor the bags pass to the opening conveyor, a short flat belt with skirt

boards on both sides, shown in Fig. 2.

Above the opening conveyor is an empty bag conveyor which is a continuous trolley equipped with a succession of three-pronged hooks on spring suspension. In opening the bags, one operator cuts open the forward end of a bag while a second operator affixes one of the hooks from the trolley in the other end. This acts to tilt the bag up and spill out its contents down the chute shown in the central part of Fig. 2. The trolley conveyor then removes the bags to the empty bag handling point. Sugar passes down the chute to another short flat belt that feeds it to a crusher or breaker. Beneath the crusher is a hopper feeding to a ribbon screw conveyor which, in turn, feeds the raw sugar to the boot of a bucket elevator. By means of this elevator, the raw sugar is raised to a point above the raw sugar storage bin.

While the raw sugar handling layout that has been described is extremely simple and compact for the quantity of sugar handled, it is beyond the raw sugar bucket elevator that innovations in sugar handling have been made, as the preceding equipment varies from many other layouts principally in requiring less labor per ton handled.

Reference to the drawing, Fig. 3, will show the general conveyor layout in the Sucrest refinery. Note how the bucket elevator delivers the raw sugar to a horizontal run-around 11-in. side pull Redler conveyor located above the raw sugar storage bin. This conveyor is also shown in Fig. 4. It is unusual in that it has no bottom plate except at the receiving point. Consequently, as the sugar in the bin builds up level with the conveyor bottom, it forms its own bottom plate, thus causing the bin to be progressively filled to full height along the path of the conveyor.

This raw sugar bin holds 275 tons, about a 16-hour supply for the refinery. As an intermediate storage point, it serves to convert the jerky, intermittent flow of raw sugar from the bag opening operation into a steady feed of raw sugar to the refining equipment. From this point on, the design of the plant, made with the conveyor selection in view, is such as to take maximum advantage of gravity flow and reduce the need for handling equipment to a minimum. Therefore, the first operations of the refining process require that the sugar be lifted to the top of the refinery.

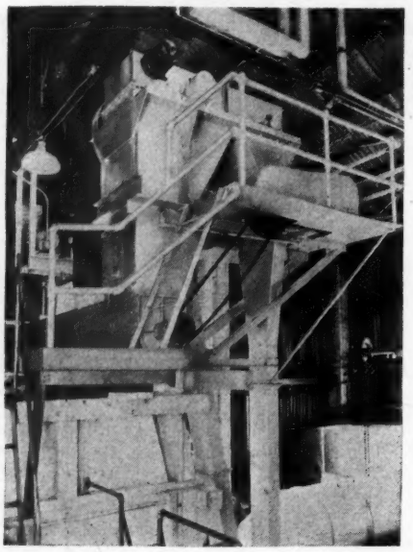


Fig. 7—Discharge of elevator shown in Fig. 6, with screw conveyor for distributing damp sugar to bin below and dryer at lower right

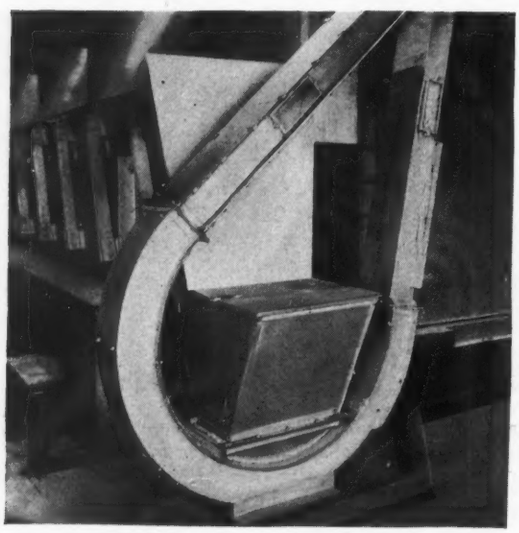


Fig. 6—Here is shown the loop boot of the 9 in. Redler elevator which raises centrifugal sugar to a bin in the upper story from which it is fed to the dryer and granulator

Sugar is removed from the raw sugar bin by means of two 11-in. enclosed run-around Redler conveyors placed beneath the bin, as shown in Fig. 5. The bin bottom is flat and the sugar is drawn off through 36 x 18 in. openings controlled by quadrant gates.

The two reclaiming conveyors below the bin discharge into a combined horizontal and inclined Redler conveyor which delivers the raw sugar to the mingler above. Flow of materials during processing is then by gravity or pump until the sugar is discharged in refined, but still damp condition from the final centrifuging operation.

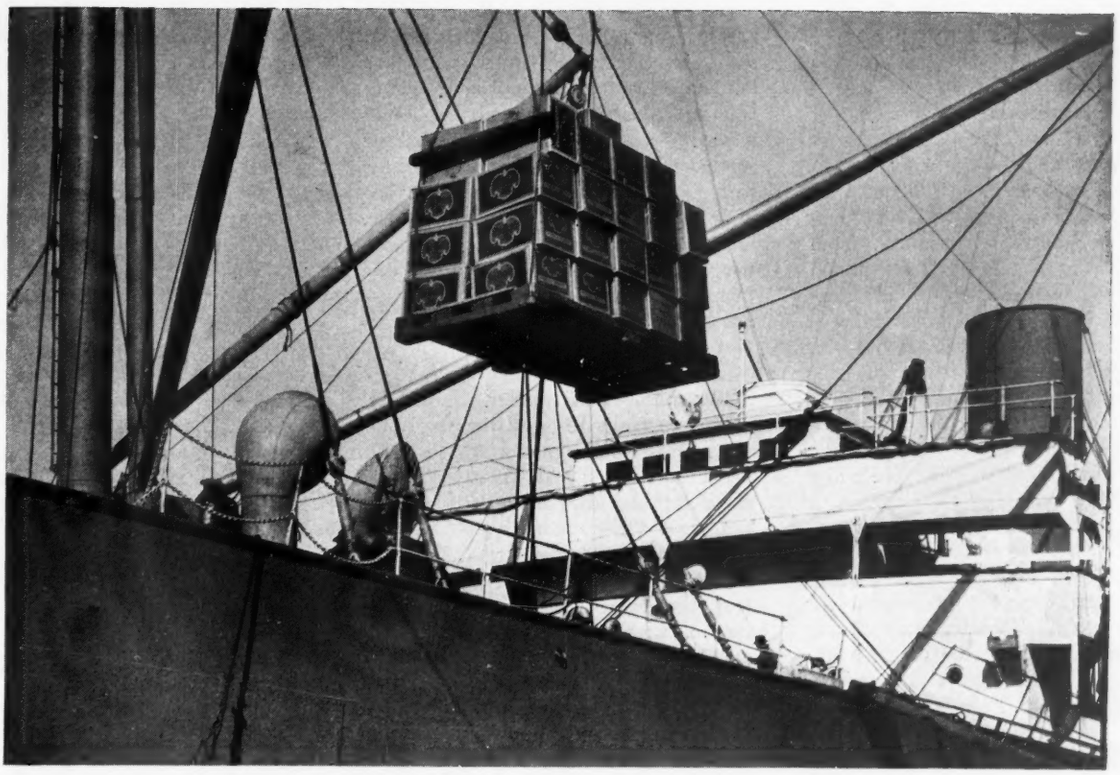
From the centrifugals, the sugar passes to a horizontal "grasshopper" or reciprocating, conveyor, which serves to even out the feed to the next conveyor, shown in Fig. 6 and Fig. 7. This is a 9 in. Redler elevator with a loop boot. It raises the still-damp sugar to a bin at the top of the building. Its capacity is 35 tons per hour.

From the bin, the damp refined sugar passes to a dryer and then to the feed of a 7 in. Redler elevator of loop boot construction. This last conveyor delivers the dry sugar to the hoppers over the bagging machines (Fig. 8) where it is packaged and passes to finished storage and shipping.

This simple handling layout illustrates the points made at the beginning of the article. The Redler conveyors and elevators, which form the main elements of the system, occupy less than one fourth of the space required for other types of conveyors adequate to handle the same quantity of material. Also, because of their "endless-chain" design, these conveyors can move the material up, down, along a horizontal or on an incline. This last feature makes it possible to coordinate the processing and handling equipment into a layout that occupies the least possible building space, even when adequate work and maintenance areas are provided. Such an original compactness in design makes a saving in first cost of buildings and, because buildings are smaller, requires less expense for building maintenance.

Because the conveyors used in this system are smaller for the quantity of material handled, there is a saving in power requirements. This, of course, is small, as most of the load moved consists of sugar rather than conveyor parts. Nevertheless, even a slight saving of this nature mounts up in a plant that operates continuously on a 24-hour basis.

Finally, because of the choice of handling equipment and its layout, maintenance in this plant has been made inexpensive and easy. One feature is that the design of the Redler conveyors reduces the amount of cleaning necessary in the plant, as it confines the sugar in an enclosed space, a particularly important consideration in handling sugar in the dry, granulated state.



Packaging canned fruits and vegetables for export presents difficult problems. Packaging for export to some countries may be the same as that for domestic distribution. Exporting to other countries requires special export packaging.

How Foods Are Packaged For EXPORT

Containers must meet custom requirements, prevent losses, protect quality and meet merchandising practices at destination

By JOSEPH LEEMING
Transportation Division,
Bureau of Foreign and Domestic Commerce, Washington, D. C.

MANY American manufacturers of prepared foodstuffs have firmly established their products in all the principal markets of the world. Their distinctive labels and trademarks are as familiar to the populations of Africa, Asia, Latin America and Europe as to the residents of New York, Chicago or San Francisco. In great measure, foreign acceptance of American foodstuffs has been due to high quality, modern and sanitary methods of production, well-directed sales and advertising efforts and proper packaging to insure safe delivery in salable condition. Proper packaging has in many instances been a major influence in maintaining good will and building up increased foreign sales for American exporters.

While the United States export trade in crude foodstuffs was very much lower in 1939 than in the preceding year, dropping from $248,986,000 to $110,757,000, foreign shipments of manufactured foodstuffs recorded a very considerable gain, rising from $184,124,000 in 1938 to $202,527,000 in 1939. The decrease in crude foodstuffs exports was largely the result of reduced foreign purchases of wheat, corn and fruit. Exports of grains and preparations which had been in heavy demand in 1937-38, when crops in other parts of the world were short, declined by 55 percent in 1939, chiefly because of more abundant supplies outside the United States.

Even with the falling off in the

shipments of crude foodstuffs, however, total exports of foodstuffs, valued at $313,323,000, represented nearly 10 percent of our total exports for the year.

Shipments of nearly every major item in the manufactured foodstuffs classification showed an increase in 1939. Exports of meat products, including lard, rose from $46,765,000 to $51,954,000; of dairy products, from $6,047,000 to $7,093,000; of canned fruits, from $23,228,000 to $25,061,000; and of canned and prepared vegetables, from $5,576,000 to $6,644,000. Dried and evaporated fruits and oilcake and oilcake meal were the only two major product groups for which the 1939 exports were smaller in value than those of the preceding year.

The majority of American exporters today realize that the packing which is suitable for one foreign country may be entirely impractical for shipping to another country where handling facilities at the ports, methods of interior transportation, climatic conditions, custom duties and other factors may radically influence the type of outer shipping container and interior packing. Since American foodstuffs are shipped today to every part of the world, exporters must be cognizant of local practice in a great number of countries with widely varying merchandising habits and conditions of transport and climate.

Cereals and Cereal Products

Cereals and cereal products are the most important class of exported foodstuffs, amounting in 1939 to $99,549,000 and representing approximately 32 percent of total foodstuffs exports. Nearly 8,000,000 bbl. of wheat flour, more than 20,000,000 lb. of oatmeal, 292,000,000 lb. of milled rice, 7,000,000 lb. of cereal foods and 6,150,000 lb. of biscuits and crackers were exported last year.

Flour shipments, while indicated in barrels in the foreign trade statistics, are, of course, sent abroad chiefly in bags. In the larger mills, bags are automatically packed on a traveling belt and automatically weighed. Only a sewing-machine tender is necessary for closing the bags. There is a wide range of bag sizes, and several bagging materials are in common use. One well-known company uses bags ranging from 1-lb. to 220-lb. and from 1-kilo to 95-kilo capacities. These are made of both bleached and unbleached cotton cloth, cotton drill and osnaburg. Large sacks designed to hold a number of smaller cotton bags are made from 10-oz. common, 10-oz. extra or 12-oz. common cotton cloth, depending on the destination of the shipment and the strength properties required. Other covering sacks are made of jute, osnaburg and rubber drill. Common packagings in one large covering sack are: fifty 1-lb. cotton sacks; twenty 2½-lb. cotton sacks; twenty 5-lb. cotton sacks; sixty 6-lb. cotton sacks; twenty 10-lb. cotton sacks; eight 12-lb. cotton sacks; six 20-lb. cotton sacks; four or five 24-lb. cotton sacks; four, five or six 25-lb. cotton sacks; two 48-lb. cotton sacks; two 49-lb. cotton sacks; two or four 50-lb. cotton sacks; and two 98-lb. sacks.

When shipping to countries with hot and humid climates, where the danger of spoilage is greatest, some companies are packing flour in lightweight, thin-gage, tin drums with plywood jackets. These hold 50 and 65 lb. of flour. Other plywood drums are in use which are designed to hold eleven 2½-kilo cotton sacks and ten 10-lb. cotton sacks.

A considerable portion of the United States exports of oatmeal and rolled oats is shipped in bulk in sacks or bags. Last year, 3,121,000 lb. was sent abroad in this manner.

Other shipments of oatmeal and rolled oats, 16,896,000 lb. in 1939, were forwarded in package form. Retail boxes or cans were packed in nailed wooden boxes or fiberboard cartons. Varying numbers of packages or cans are packed in the outer container, usually eighteen 20-oz. packages, twelve 48-oz. packages or thirty-six 20-oz. cans.

Many thousands of packages of cereal foods, biscuits and crackers are shipped in fiberboard cartons to nearby export markets and to countries with good handling and transport facilities and a temperate climate. For such shipments these containers apparently have been satisfactory. Double-wall corrugated fiberboard containers of 500-lb. bursting strength are used by one of the larger companies in this field. Some shippers of these products have reported that there is a greater tendency on the part of stevedores to handle a lighter package more carefully than they would a heavier case. Wooden boxes are used in considerable volume when shipping to some European country, usually because of the request of the importer, who wishes to sell the boxes.

As a rule, shipments of biscuits and crackers going to countries with a humid climate require special protection. This is largely due to the fact that they may remain on the dealers' shelves for an extended period. A recent report from Charles O. Thompson, acting trade commissioner at Singapore, states: "Long experience has dictated the wisdom of using tin-lined airtight and moisture proof boxes for all perishable goods which are not individually packed in airtight containers. Such products as crackers and biscuits arrive in Malaya in good condition only if packed in airtight tin containers which are, in turn, packed in wooden boxes. If packed in paper cartons which, in turn, are shipped in airtight containers, they would conceivably arrive in good condition, but they would not long remain so in the moist climate prevalent throughout southeastern Asia. It is true that some importers are bringing in crackers in paper cartons contained in airtight cases, but most importers consider the practice unsatisfactory."

Wooden barrels are used for exporting a number of food products, among them apples, hard candy, malted milk, granulated sugar, molasses and fresh mackerel.

Fruits and Vegetables

Fresh, canned and otherwise prepared fruits and vegetables constitute the third largest group of export foodstuffs products. The total value of shipments in 1939 was $98,695,413.

Shipments of fresh oranges totaled 6,297,000 boxes; fresh pears, 97,193,000 lb.; fresh lemons, 792,000 boxes;

The size of bag and choice of bag material selected for shipment of foodstuffs to foreign countries depends on many factors—length of voyage, custom duties, handling facilities at port, interior transportation facilities, climate and merchandising habits of the country receiving the exports.

fresh grapefruit, 1,179,000 boxes. Shipments of fresh apples consisted of 1,077,000 baskets, 5,555,000 boxes (both wooden and fiberboard) and 582,000 barrels. The containers used for these products have in general been fairly well standardized and, therefore, will not be described in this article.

Canned fruits and vegetables still present a number of difficult export packing problems. Whether wooden or fiberboard boxes are used, there appears to be a considerable amount of damage to the cans. In some cases, cans are dented; in other cases, rusted. Not infrequently cans arrive with labels spoiled by moisture. Some shippers have packed their canned goods destined to long ocean voyages to tropical countries in fiberboard cartons, which, in turn, are packed in nailed or wire-bound wooden boxes. The merit of this dual type of packing is that the fiberboard case helps to absorb internal shocks, while the wooden case protects the contents from external damage. Separators, if they can be used, eliminate a considerable amount of denting. Waterproof paper case liners have helped to reduce damage from moisture.

The research committee on marine moisture damage of the Association of Marine Underwriters of British Columbia has conducted extensive tests and has found that rusting of cans during a long ocean voyage can be very materially lessened if the shooks of which wooden cases are made have a moisture content of less than 17 percent.

Dried and evaporated fruit, prunes, raisins, apricots, apples, pears and dried fruits for salads are important export items. Shipments in 1939 totaled 396,046,000 lb., valued at $21,900,000. Such fruits are packed in bulk in 25- and 50-lb. boxes, or for some countries, in 12½- and 25-kilo boxes. Both wood and fiberboard boxes are used for these packs. Dried fruits are also packed in various sizes of consumer packages, which, in turn, are placed in either wood or fiberboard boxes. Occasional shipments going to tropical countries are packed in tin-lined cases. Other shipments go forward in wooden drums.

Meat Products

Next to cereals, the most important foodstuffs items exported are meats and animal products, of which the most important are large cured hams and shoulders, canned meats, bacon and oleo oil. Total exports of meat products in 1939, including lard and other animal fats and oils, were valued at $52,961,041. Meat products accounted for 17 percent of our total foodstuffs shipments to other countries.

The standard export box for lard is a specially developed container that does not correspond to any box used for domestic shipment. The box measures 18x13¼x7¾ in. The sides, top and bottom are of ⅞-in. thick-sawed lumber. The sawed-lumber ends are ⅞ in. thick. Boxes are generally made of hardwood lumber, although in some sections white pine lumber is occasionally used. Each box has a central wooden partition which divides the box into two compartments, accommodating a block of lard in each compartment. The blocks weigh 28 lb. net for shipment to England, 27½ lb. for continental Europe, 12½ kilos net for those countries where the metric system obtains. Boxes are lined with parchment paper, and each block of lard is wrapped in greaseproof paper. A single galvanized-wire strap is applied lengthwise of each box. Lard goes forward in regular shipping space, or, for some shipments to tropical countries, in ventilated space.

The export box commonly used for hams measures, inside, 30x24x23½ in. Ends are constructed of tongued and grooved sawed-lumber boards or plywood. In either case, the ends are double-cleated with notched cleats, or No. 2½ style. Sides, tops and bottoms are all of tongued and grooved sawed-lumber board. All boxes are lined with parchment paper and are strapped with two flat galvanized-iron straps nailed to the box. A lightweight wire-bound box is widely used for 100 lb. export shipments of hams. This box is made of $\frac{3}{16}$ in. southern veneer throughout and is bound with No. 15 gage wire.

One of the large packing companies has developed an interesting method of packing export hams under very high pressure to reduce the cubic measurement of the package. To withstand the required pressure, a box of ¼-in., three-ply plywood is used. It is made of cottonwood, which does not taint the meats. Strong 2x⅞-in. cleats made of southern hardwood and 1-in. metal straps give the box the strength needed to carry safely its highly compressed contents.

Other Food Products

Wooden barrels are used in a large number of export shipments of a number of diverse food products, including hard candy, fresh mackerel, malted milk, molasses and granulated sugar. Cloth bags of different types are employed to carry such products as apricot kernels, malt barley, onions, potatoes, granulated sugar and walnuts. Shippers of some types of boxed cheeses have found that they can reduce weight and measurement by baling a number of boxes in burlap, and this method may well be applicable to export shipments of other types of foodstuffs.

Further and more detailed information on the subject of export packing of foodstuffs is contained in the new 530-page book, "Modern Export Packing" (Trade Promotion Series No. 207), prepared by the Transportation Division of the Bureau of Foreign and Domestic Commerce. This has just been published and may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., or local offices of the Bureau of Foreign and Domestic Commerce.

Continuous Quick Freezer Developed by Birdseye

Has automatic feed and discharge—Takes little floor space—Is portable—Freezes products loose without dehydration

STRAIGHT - LINE continuous quick freezing of loose products is possible with a new machine developed by Clarence Birdseye. The product flows steadily and evenly into, through and out of this unit without the help of human hands anywhere along the freezing route. One man can operate a battery of four machines, and his task is merely that of a watchful attendant. Moreover, the freezer takes little floor space by virtue of its "vertical" construction. Then, too, the unit can be put into the canner's production line at the most suitable point because it is equipped with its own envelope of insulation. It need not be placed in a cold room. Still another factor in the freezer's favor is the fact that it operates with almost no shrinkage of the product from loss of moisture. Finally, but fortunately for large canners, the unit is portable. It can be moved easily with the crops and with the seasons.

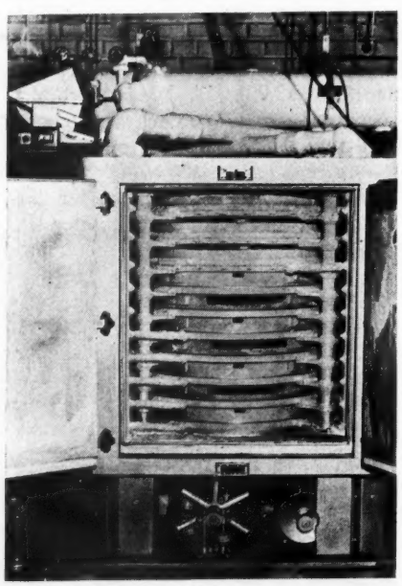
The first of these machines, known as the "Gravity Froster", operated during the summer of 1939 at Gloucester, Mass. Then in October it was moved to Deerfield Farms, Bridgeton, N. J., where commercial quantities of small lima beans and cut string beans were frozen. This summer it has been in operation at the Rehoboth, Del., plant of Stokely Bros. & Co. This first unit has ten freezing plates.

Examination was made of products packed early last October and kept in commercial cold storage until June 10 of this year. There was no perceptible desiccation, and the product was still entirely free-flowing and of excellent flavor, according to Mr. Birdseye. This food had been packaged in 2½ lb. transparent cellulose lined cartons wrapped with waxed paper.

The Gravity Froster is designed primarily for the quick-freezing of bulk products and "loose" vegetables and small fruits. It is said to be suitable for quick freezing cream, broken eggs, fruit juices, crushed fruits, sliced berries with sugar, peas, lima beans, string beans, cut corn, whole strawberries and sliced peaches.

With the refrigerant at −25 deg. F., the hourly capacity of a 20-plate gravity froster is rated at 1,600 lb. of vegetables and small fruits. And at an operating temperature of 0 deg., it is expected to freeze approximately 2,000 to 3,000 lb. of whole strawberries or sliced peaches, 2,500 lb. of crushed fruit and approximately 4,000 lb. of 40 percent butterfat cream. Actual freezing time for vegetables and small fruits is placed at approximately 25 minutes; for whole strawberries, 15 minutes; and for cream and fruit juices, less than 10 minutes.

Products which are composed of masses of individual units—for example, peas—emerge hard frozen and free flowing and without any cohesion between the individual units of the mass. Such products are ready for immediate shipment or storage without any additional refrigeration. Crushed fruits and liquid products may be either hard frozen in a form much resembling planer mill shavings, or they may emerge as a hard slush. The latter form is preferred because the slushed product may be automatically placed into any size or type of container. The temperature of the slush emerging from the apparatus may be sufficiently low to prohibit either bacterial or crystal growth during the hardening period, Mr. Birdseye reports. With such products as lima beans, the temperature of the food as it leaves the ten-plate freezer is approximately 10 deg. F. when the refrigerant temperature is −25 deg. F., and the time in the machine is about 25 minutes.



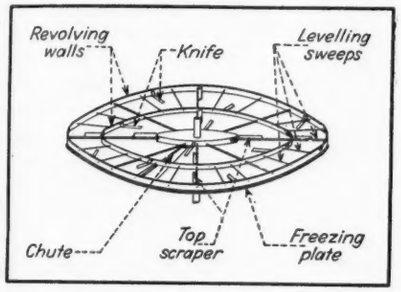
Ten-plate "Gravity Froster" with doors open to show plates. Note automatic vibratory feeder at top.

Fed into the machine at the top, automatically from a vibratory hopper, the product passes over a series of horizontal refrigerated plates. These plates, which are circular, are arranged in a series, one below the other. As the product completes the circuit of one plate, it falls through a slot onto the plate just below, keeping this up until it reaches the bottom of the machine. Then it falls onto a conveyor and passes on to the packaging line.

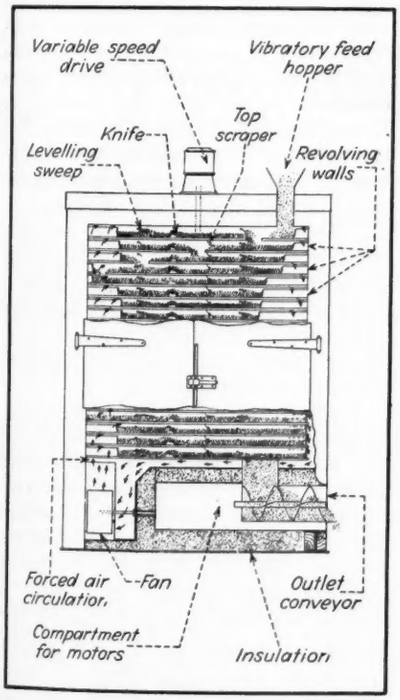
As the food moves through the machine, it is subjected to a current of refrigerating fluid. This may be in the form of ordinary air, inert gas, sirup or brine (air is being used in the first machine). The fluid is recirculated, and with air it is claimed that no moisture is added to or taken away from the product. The purpose of the refrigerating fluid is to give additional freezing effect, supplementing the main effect produced by the metal plate. While the first unit has ten stations or plates, the standard Gravity Froster will have 20 plates, will occupy 36 sq.ft. of floor space, will be easily portable, and will have a rated output of from 40 to more than 100 lb. per hour per square foot of floor space.

Each of the 20 plates will be approximately 17/32 in. thick, 5 ft. in diameter, and with a 20-in. hole in the center to accommodate the rotating shaft that drives scraping and leveling devices over each plate. In each plate also is a radial slot about 6 in. wide, extending substantially across the freezing zone of the plate. This is the opening through which the product passes to the plate below.

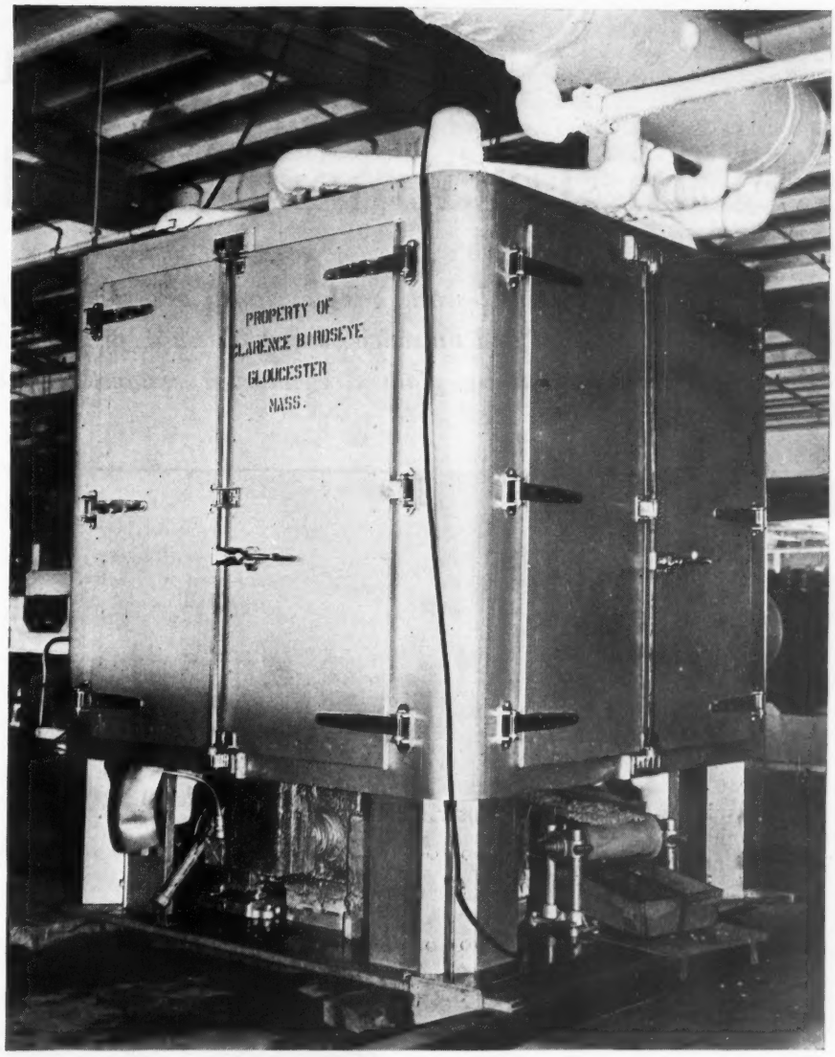
Spokes extending from the rotating shaft actuate walls (circular metal bands) which delineate the inner and outer circumferences of the freezing zone on each plate. Attached to these moving metal bands; or walls, are the scrapers or knives which agitate the product (so that the pieces do not stick together) and aid it in passing along the plates, at the same time removing frost from the top and bottom surfaces of the plates.



Drawing of stationary freezing plate and revolving walls assembly. Scrapers agitate product, move it over the plate and remove frost from plate.



Diagrammatic drawing of 20-plate Birdseye "Gravity Froster." It consists of a series of refrigerated plates, and the product moves over each plate in traveling from the inlet at the top to the outlet at the bottom. Air is blown over product to aid in freezing.



Ten-plate "Gravity Froster" developed for continuous freezing of loose products. It requires little floor space and little labor. It does not dehydrate product and it is portable. Belt discharge conveyor will be replaced with screw conveyor.

Fed onto the upper plate just in front of the radial slot in it, the product is intermittently moved along the surface of the plate by the action of the scrapers until it comes to the rear side of the plate slot. Then it drops to the plate below. Thus the product progresses around each plate and downward from plate to plate until it emerges onto a conveyor close to the floor.

All parts of the freezer coming in contact with the product will be of stainless steel or will be heavily chromium plated. The whole unit is designed to meet stringent sanitary requirements and can be readily disassembled for thorough cleaning or sterilization. Frequent defrosting is not necessary because the frost is removed from the plates, as it forms, by the scrapers, but the unit is defrosted once a week.

Ammonia liquor is the refrigerant used. This is forcibly pumped through the several plates, the plates being hollow. For the ten-station unit now in operation, approximately six tons of refrigeration is required when freezing lima beans at a rate of around 400 lb. per hour.

Exclusive rights to the gravity froster have been taken over by Gravity Froster Corp., Boston, Mass., this corporation having been formed by a group of New England business men to develop and exploit the apparatus. A full-size 20-station machine has been designed and may shortly be built, and it is the intention of the present licensees to make the apparatus generally available to the food processing industry.

New Developments In Treatment of Milk Wastes

Experimental work has developed a system for prevention of stream pollution and nuisance caused by waste products of milk receiving stations, bottling plants, creameries, condenseries and cheese factories

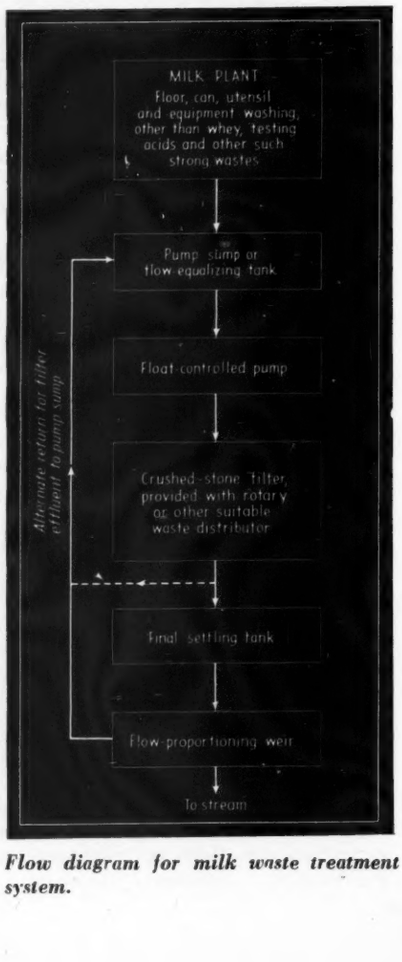
By L. F. WARRICK
State Sanitary Engineer, State Board of Health, Madison, Wis.

WASTES from milk products plants vary considerably in character and strength. They may be grouped and briefly described as follows: (1) Milk can and car washings, essentially a weak solution of whole milk; (2) floor washings, containing spilled milk, cream, buttermilk and skim milk, along with any dirt that may collect; (3) buttermaking wastes, inclusive of churn washings, essentially dilute buttermilk; (4) cheese vat wastes, washings containing more or less whey; (5) condenser waters, milk content of which depends on entrainment losses in operation; (6) ice cream machine washings; (7) miscellaneous equipment and utensil washings, along with the cooling waters used in the various processes.

Strong effluents, such as whey, skim milk, buttermilk, testing acids, etc., are considered in a special class as they are generally utilized or should be disposed separately from the washings. The domestic sewage, being different in composition from milk wastes, is usually disposed of by septic tank and dry well or soil absorption systems, or is discharged directly into public sewerage systems.

The first step in handling milk waste problems is to reduce the volume and strength of the washings. This can be accomplished, often to a very substantial degree, by practicing "good housekeeping" methods. Collection of drippings from cans will effect a material reduction in milk solids discharged in the wastes. Care in operation of evaporators will reduce milk loss in condensery wastes. Mixing of the first washings of cheese vats with the whey, with return of this waste to factory patrons for feeding purposes or other utilization, is most helpful in reducing the losses from cheese manufacturing plants. By exercising reasonable care the personnel of any milk establishment can keep costs of installation and operation of treatment systems at a minimum.

Most of the milk waste treatment installations originally made in Wisconsin were septic tanks with dry wells or subsurface tile systems for disposal of effluents by soil absorption. With fairly porous soil conditions and a reasonable amount of attention, these installations have often furnished a solution for nuisance and pollution problems. Where clay or relatively impervious soils were encountered, contact beds or sand filters were used for providing additional treatment for effluents from septic tanks prior to discharge into drainage ditches or watercourses.


MILK PLANT
Floor, can, utensil and equipment washing, other than whey, testing acids and other such strong wastes
Pump sump or flow-equalizing tank
Float-controlled pump
Crushed-stone filter, provided with rotary or other suitable waste distributor
Alternate return for filter effluent to pump sump
Final settling tank
Flow-proportioning weir
To stream

Flow diagram for milk waste treatment system.

An experimental station was established by the Sanitary Engineering Division of the State Board of Health at De Forest in 1927, and studies of various processes of milk waste treatment were conducted until the fall of 1930, results of the early work having previously been published.[1] The treatment processes originally considered were activated sludge, chemical precipitation and several types of trickling filters. Chlorination and ozone treatment studies were also conducted. It was concluded from this work that treatment of the milk wastes could best be accomplished by trickling filters. Based upon data obtained at De Forest, as well as the results obtained by Levine,[2, 3, 4] Kimberly[5] Slaughter,[6] Eldridge[7, 8] and others, demonstration plants were designed and installed at various types of milk plants where nuisances and serious pollution problems existed.

Initial installations included a rectangular flow-equalizing tank receiving the pollutional wastes from the milk plant, this tank having a capacity sufficient to take practically the entire day's flow. The object was to provide storage capacity sufficient to permit a uniform filter dosage rate over a period in excess of 8 to 12 hours, the normal operating day at milk plants. The waste was pumped from the flow-equalizing tank to an elevated dosage tank by means of a float controlled centrifugal pump. From the dosage tank the waste discharged by gravity through a system of pipes or open channels to a battery of tip troughs above distribution boards, which

Construction details of milk waste filter, showing original installation of circular filter with fence-wire wall to hold crushed rock in place.

In this article on
WASTE DISPOSAL
Of primary importance to
Canners, Dairy Products Manufacturers and Meat Packers

The author shows how simple equipment for treating wastes, adaptable to use in the small plant, has been developed through research in the Wisconsin dairy industry—The Editors.

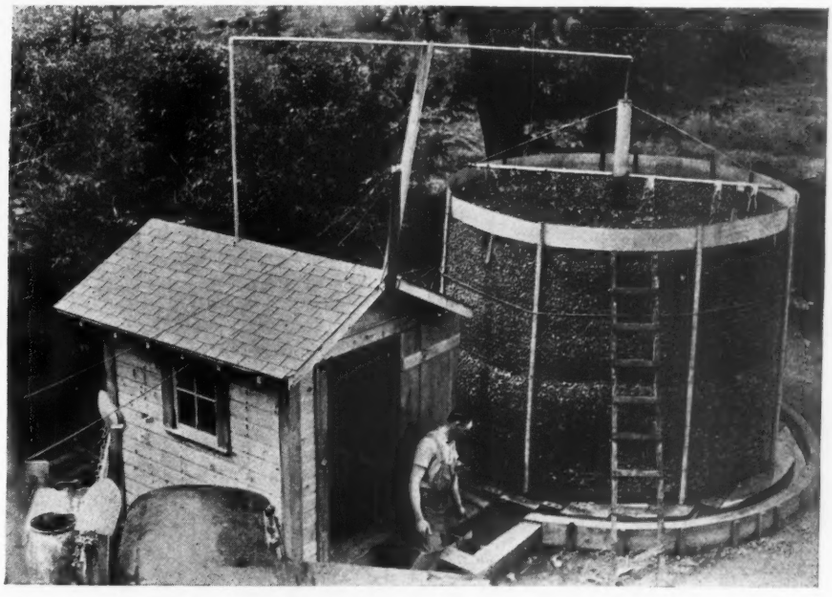
spread the waste over the surface of the filter. The filter unit was rectangular in shape and eight feet in depth. The effluent from the filter was either discharged into a city sewer, or into a stream after passing through a secondary settling tank for removal of solids sloughing off the filter rock. The filter was housed, the roof being sufficiently high above the surface to allow a man to carry on the necessary cleaning operations.

The studies made during 1930 and 1931 indicated that, while in general this type of plant would give satisfactory results, several changes could advantageously be made. Accordingly, during 1931, the engineering staff of the Carnation Co., working in conjunction with the State Board of Health engineers, designed a disposal plant for the company's condensery at Chilton, Wis. This design differed from the original described above in that the filter was circular rather than rectangular, the waste being applied by means of a rotary distributor instead of tip troughs. The filter unit was not covered, the walls consisting of a series of pipe uprights, imbedded in a concrete curb, supporting ¾ in. poultry wire strengthened by fence wire. The waste from the condensery flows to a storage tank and is then pumped to the filter unit by means of a sump pump, the pump being controlled by a time switch. While the dosage period can be readily varied, the filter usually is operated on a cycle of 7 minutes dosage and an 8 minute rest period. The filter effluent discharges through a secondary settling tank into the nearby stream.

Studies were made at the demonstration plants described above and treatment results published.[9] It was concluded that properly designed and operated trickling filters, built of 1 to 2 in. crushed rock, 6 to 8 ft. in depth, and having a capacity of 80 cu.ft. of rock per pound of 5-day B.O.D. (biochemical oxygen demand) applied per 24 hours, will normally reduce the pollutional strength of the wastes (as measured by the 5-day oxygen demand test) 80 percent or more.

A typical milk waste treatment system of the trickling filter type, designed on the above basis, was installed at the Pet Milk Co. plant at Palmyra, Wis. The milk plant has an average milk intake of 40,000 lb. of milk. The plant consists of a small sump from which a time clock and float control pump discharges the milk plant washings at a rate of 45 gal. per minute direct to the rotary distributor of a trickling filter 35 ft. in diameter and 8 ft. deep. The filter is constructed of crushed rock, held in place by heavy fence wire, the wall supported by vertical pipes embedded in a concrete base provided with a windbreak at the top. The effluent discharges into a channel at the circumference of the base and flows to the final settling tank, 5 ft. wide and 12 ft. long. The cooling water from the plant is bypassed to dilute the filter effluent. Analysis of composite samples shows approximately 88 percent reduction in the oxygen demand of the milk wastes, or an effluent of about 40 to 50 p.p.m. (parts per million), 5-day B.O.D. before dilution with the cooling water.

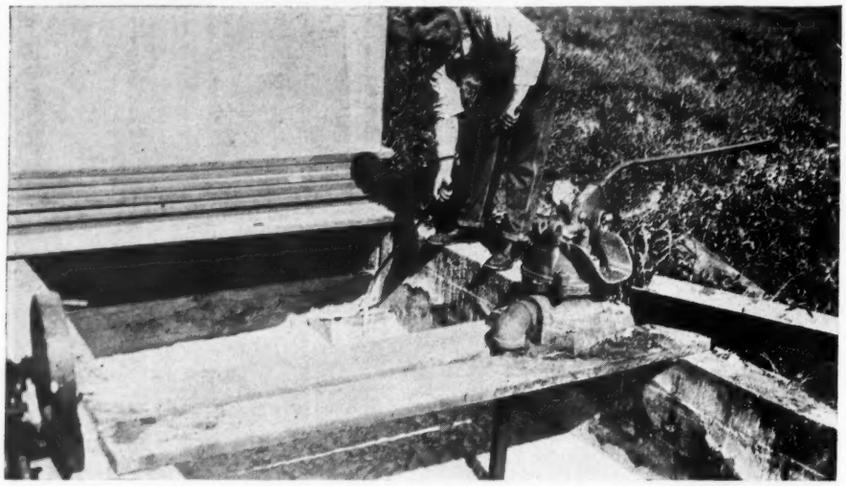
A number of plants of this kind have been built in recent years, giving very good results with reasonable care in operation. The trend has been toward a coarser filter rock, 2 to 4 in., with fairly continuous application of the wastes over a full day and with recirculation of filter effluents to dilute and otherwise condition the raw wastes. Facilities for controlling



High capacity filter treating washings from a small cheese factory, with operator pointing to a simple flow diversion device at filter outlet.

the discharge of the effluent to the receiving sump or effluent sewer in whole or in part have been provided through adjustable weirs. In the treatment of a fairly strong cheese factory waste, relatively small in volume, prior to final disposal with municipal sewage, it was found that 100 percent recirculation through most of the 24 hour day, with release of the effluent each morning at start of factory operations, gave satisfactory results.

Two-stage filtration has been employed, reversing of flow being reported as beneficial in reducing the possibility of filter ponding or clogging. Barrett[10] has reported some very effective treatment results in



Removing sludge and scum from settling tank of milk waste treatment system. Mechanical facilities are being used for this purpose in larger plants.

work abroad. Halvorson [11] has published some interesting data on studies of the aero-filter, or high capacity filter units with tile and other filter media.

The plan advocated by Halvorson consists of practically continuous application of wastes to a filter at rates of 20 to 30 million gallons per acre of surface area per day, with recirculation of the effluent and forced filter ventilation. By this system a waste with 4,000 p.p.m. B.O.D. had been reduced to an effluent averaging 120 p.p.m. B.O.D. and pH 7.2.

According to Waring and Hatch,[12] studies conducted in Ohio recently with three methods of milk waste treatment have further verified the view that trickling filters offer the most practical and economical devices for removal or stabilization of pollutional constituents in milk wastes. The methods studied were: (1) Chemical treatment and air flocculation with recirculation of solids settled out of the wastes; (2) lime conditioning followed by activated sludge; (3) waste storage followed by trickling filter treatment. The tests were conducted continuously over a month of operation of each system. The treatment conditions and results obtained are essentially as follows:

In the first process the wastes from a cheese factory with a milk intake averaging 35,000 lb. per day and a loss in the wastes of 2.3 percent are discharged through a coarse screen into a tank or pump sump. The washings, containing only such whey as unavoidably spilled in the factory, had a strength averaging about 900 p.p.m. B.O.D. and 6.4 pH. The wastes are pumped into a constant flow regulating box and lime and ferric chloride are added in solution and mixed with the wastes as they flow by gravity into aeration tanks. Compressed air is forced through a pipe grid system into the bottom of the aeration tank, the air bubbling upward through the wastes as they pass slowly through the tank to the final flocculation and settling tank for solids removable from the wastes. The settled solids are continually being pumped back to mix with the wastes entering the aeration tank, the excess beyond the amount necessary for recirculation being periodically removed and disposed of by burial or otherwise. The effluent from the final settling tank averaged about 100 p.p.m. B.O.D. during the tests, fluctuating considerably in strength with daily variations in loading and operating conditions. Factory officials indicated operating costs, including power, chemicals and labor to be around $200 per month. They further indicated that the system was satisfactorily taking care of the local problem.

It has been shown that the iron salts precipitate albumen and casein, and in the process described, it is believed that through the aeration process there is a catalytic action of the ferric precipitate in bringing about a rapid oxidation of the residual lactose to carbon dioxide and water.

The second treatment method studied involved wastes produced in a plant producing butter, cottage cheese and cream said to have a B.O.D. strength untreated and undiluted of 1,000 to 1,200 p.p.m. The cottage cheese whey is not treated by the waste disposal system but is hauled away from the plant for stock feeding purposes on nearby farms. The vat washings and other liquid wastes are conveyed to a collecting tank or sump, from which an air lift pump discharges them into the lime flocculation or conditioning tank. Lime in solution is initially mixed with the wastes as they are pumped, and further mixed by compressed air bubbling upward through the contents of the flocculation tank. The sludge removed in the preliminary settling tank, through which the lime treated wastes slowly flow, is periodically hauled, under contract with a local farmer, to an isolated place for disposal. This first step in treatment reduces the B.O.D. from 20 to 30 percent. Then the wastes (pH 8.0-8.2) are treated by activated sludge process, aeration

(*Turn to page 99*)

References

1. L. F. Warrick, R. T. Homewood and H. W. Ruf, "Progress in Dairy Waste Treatment in Wisconsin," *Butter and Cheese Journal*, April 10, 1929; also Progress Report of the State Committee on Water Pollution, Bureau of Sanitary Engineering, Wisconsin State Board of Health, pp. 16-17, February, 1931.
2. Max Levine, "Fundamentals in the Purification of Creamery Wastes," Bulletin No. 77, Iowa State College, October 14, 1925.
3. Max Levine and Lulu Soppeland, "Bacteria in Creamery Wastes," Bulletin No. 77, Iowa State College, May 12, 1926.
4. Max Levine and Lulu Soppeland, "Proteolysis by Bacteria from Creamery Wastes," Bulletin No. 82, Iowa State College, October 13, 1926.
5. A. E. Kimberly, "Methods in Milk Waste Treatment," *Municipal Sanitation*, **1**, 89-92, 1930.
6. Claire E. Slaughter, "A Study of the Disposal of Creamery Wastes," Bulletin No. 18, Michigan Engineering Experiment Station, July, 1928.
7. E. F. Eldridge, "Treatment of Milk Product Wastes," Bulletin No. 24, Michigan Engineering Experiment Station, March 26, 1929.
8. E. F. Eldridge, "Treatment of Milk Product Wastes, Report No. 2," Bulletin No. 28, Michigan Engineering Experiment Station, March 31, 1930.
9. H. Ruf and L. F. Warrick, "Milk Waste Treatment Studies in Wisconsin," *Sewage Works Journal*, Vol. 6, No. 3, May, 1934.
10. N. W. Barrett, "The Treatment and Disposal of Milk Factory Effluents: 1. "By Means of Percolating Filters and Septic Tanks," *Journal Society of Chemical Industry*, Vol. 55, No. 10, pp. 48-54, 1936; also "The Purification of Dairy Wastes, "*Sewage Purification*, 1, 118-122, 1939.
11. H. O. Halvorson, "Aero-Filtration of Sewage and Industrial Wastes" *Water Works and Sewerage*, **83**, 312, 1936; also see *Water Works and Sewerage*, **83**, 51, 1936.
12. Unpublished data obtained during conferences and visits to plants.

Tiering a pallet board loaded with 1,800 lb. of bags. By keeping goods off floor, loss by damage is largely eliminated. Cartons are also stacked this way. The method utilizes storage space near the ceiling.

Blitzkrieg Handling Methods Adopted by Canadian Packer

Mass movements of products made by power trucks handling up to 2½ thousand pounds at a time. System coordinated with other methods.

By C. B. COOK
Elwell-Parker Electric Co., Cleveland, Ohio

BY using power industrial trucks, carefully integrated with former handling methods, Canada Packers, Ltd., has effected an outstanding modernization program at its Montreal plant.

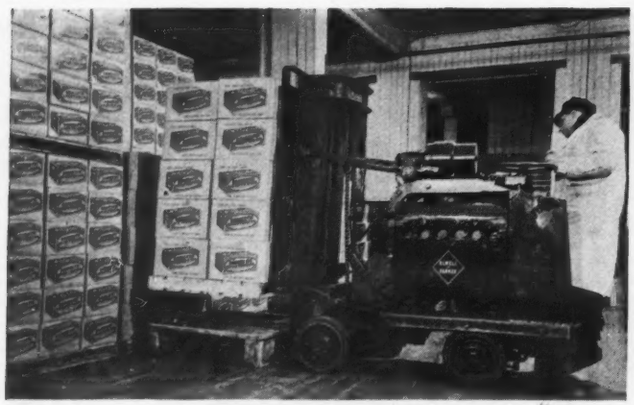
The company's development project called for unifying its various processes by means of straight-line operations through two existing multi-story buildings. Although adjacent, the buildings had been owned and operated independently and are separated by a railroad siding.

This article on
MATERIALS HANDLING
Is of practical value to
All Food Manufacturers

Because it describes how an unusually difficult problem of moving a diversity of materials to, from, in and between two plants was solved by engineered coordination of new and old handling methods.—The Editors.

The first step was to relocate the various departments to eliminate duplication and to place them so that products would flow uni-directionally, without backtracking, to delivery docks. Provision also had to be made for rapid handling of goods distributed to the retail trade. Due to the perishable nature of some goods and the increasing tendency of retailers to carry smaller stocks and order more frequently, time had become an important factor in shipping.

Goods in the Montreal area were shipped by motor truck and those to distant points by motor truck, rail and boat. Many different products are handled and items from the same order are frequently processed in different buildings. So it was necessary to devise an efficient handling system for bringing together the products



Fork truck at left is setting a pallet load of cartons of shortening upon a skid so that it may be picked up for further transport by the elevating-platform truck at right. Any type of load may be handled by either type of truck, local conditions.

from widely scattered parts of the two buildings and consolidating them into a shipment at the railroad car, or motor truck.

Different methods of consolidating shipments were tried with varying degrees of success. When the plants were first consolidated it was obvious that a connection was necessary between buildings, and a bridge was built connecting the buildings at the third-floor level. Movement of the products, however, required so frequent usage of elevators that much time was lost in waiting for elevators. Distance between departments in the two buildings often was considerable and the haul by hand truck was slow and laborious.

Since most of the movements were made and most of the tonnage was handled on the ground floor at dock level, it was apparent that an additional tie between the buildings was needed there. The docks of the buildings, which have a railroad siding in between, are less than 100 ft. apart, but at different levels. After bridging the two docks with a ramp, it was found that the resulting grade of about 8 percent was too steep for a man-powered truck fully loaded.

Battery-powered industrial trucks were then being considered for intra-departmental plant transportation. And it was demonstrated that electric trucks could easily negotiate the ramp with full loads. And after a thorough investigation of the adaptability of power trucks to other plant hauling operations, the power trucks were adopted not only for ground-floor movements between docks, but for the entire system. A handling procedure was devised that provided for orderly and efficient handling between every department and floor of both buildings and to every carrier.

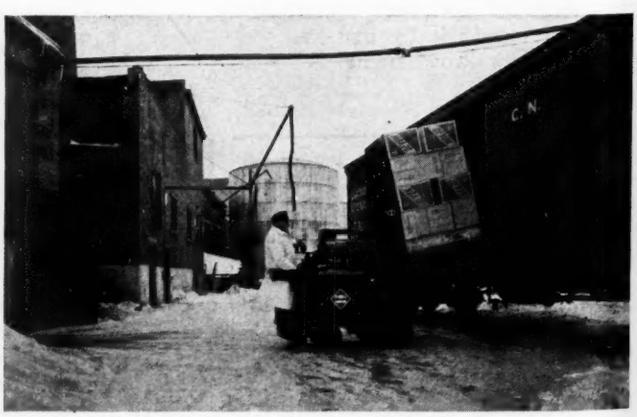
For greater flexibility of operation and to make the most efficient use of hand power, both the fork type and low-lift power truck, in conjunction with hand-lift trucks, were selected. Use of skids and pallets and the ability to handle heavy and bulky loads also were factors considered.

Fork trucks were selected for their ability to handle a variety of shapes and weights and to tier the product to save storage space. Goods on skids and pallet boards and awkward packages, such as drums and large oil cylinders, which rest directly on the bare forks, are readily handled by the fork truck. The platform lift truck is used for the lighter loads, and being lower in height, for servicing through low-clearance doorways.

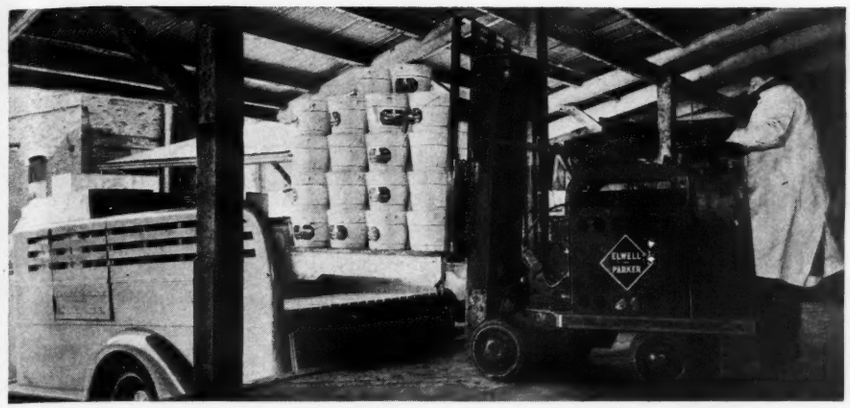
The basic thought in the system was that the power trucks would be used for the longer hauls between departments and the hand trucks within departments and for short trips to elevators.

All inbound goods and supplies now are loaded from car or truck directly onto skids or pallets and in many cases are kept in storage on the same skid or pallet until ready to be shipped, with no intermediate handling. Packaged goods such as cases, pails or bags are received from the manufacturing lines and stacked on pallets. Fork trucks then take the pallets into storage, piling them two or more high according to ceiling and floor conditions. Air space above stocks, which had been wasted when the stocks were piled haphazardly by hand, now is used. And in some instances stor-

Fork truck is loading a 1,225 lb. vegetable-oil cylinder onto motor truck from ground level—a hard dangerous task when done by hand. Same truck tiers the cylinders in storage.



Skid load of soap flakes is unloaded from a box car by a fork truck at ground level. Cars may be unloaded without waiting for a place at the docks and may save considerable car spotting.



Elevating truck is removing unit skid load of 40 boxes of butter weighing 2,560 lb. from the local truck. Skid load will be taken to butter packaging deparment.

All photos by courtesy of Edison Storage Battery Division, Thomas A. Edison, Inc.

age capacity has been doubled. Because it minimizes handling and keeps packages in order, the pallet board has proved effective in preventing damage to package and label. This is particularly true of goods in cartons.

Besides handling almost every type of package, this plant also must move various cuts of meat in quantities. Carcasses of meat move through the plant on a monorail system, but when cut, the various cuts become a piece-handling problem. Cuts such as hams, loins, bellies, shoulders and picnic hams now are moved about the plant from cutting table to curing cellar and to the smoke house in special section-bin skids by the power trucks.

Frozen small-stock carcasses, such as lamb, are transported on power trucks or towed on live skids with sectional-bin sides.

The old system made it necessary for a man from the sending department to accompany the hand truck on and off elevators to its destination. Frequently he would return with an empty truck. Not only was time wasted in transporting empty trucks, but much of it was lost in waiting for elevators. Loads now are brought on live skids to the elevator by hand when coming from nearby departments and by power truck from more distant points. The elevator operator has been made responsible for moving the live hand trucks on and off the elevator. Thus there are no man-hours lost waiting for elevators, for neither elevator nor truck waits for each other.

As a result, goods reach their destination much more quickly, and the congestion at elevators and aisles in peak periods has been greatly reduced. Loads of all shapes now are handled with ease by any workman, and danger of injury from lifting and pushing has been greatly minimized.

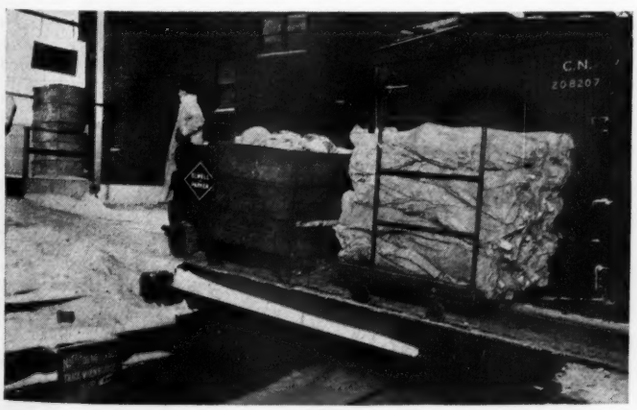
Outbound shipments are similarly handled. Loading and unloading has been speeded considerably, and by reducing waiting at the docks the utility of the motor-truck equipment has been increased. Outbound skid or pallet loads are delivered directly onto the body of the motor truck by the power truck. When products are sent to the company's uptown storage, the motor trucks are loaded with skid unit loads. The goods remain on the skids during transportation and are unloaded and moved into storage as skid units. This method was found to save time and labor in contrast to the old method of loading and unloading each individual package by hand on the docks and then picking it up later for loading on hand trucks when both men and trucks were available. Skid loads now are moved so rapidly that dock congestion has become rare.

During the navigation season many of the company's products must be delivered to steamship piers on their way overseas or to other coastal points. Boats also bring inbound shipments, adding to the heavy cartage job which is done entirely by motor truck.

Loading motor trucks at the steamer docks often is done from ground level —a hard laborious job for hand methods. Now the fork-type electric power truck is run on the empty truck at the company's docks and is transported to the piers. The power truck is driven off the motor truck down a ramp at the pier, picks up the load and moves it onto the motor truck. The truck does the lifting.

Loading jobs that formerly constituted a source of danger to a gang of workmen, such as rolling heavy packages up a barrel skid, now are easily handled by one power truck in a fraction of the time. This hauling, which had formerly required many trucks hired on a contract basis, now is done quicker by company trucks.

Small light packages from steamers are placed directly onto skids when loaded on motor trucks. Loads then are handled as skid units at the receiving dock and stored without further handling.



Elevating-platform truck carrying sectional-bin type skid load of pork cuts and pulling a live-skid load of frozen lamb carcasses up the 8 percent ramp connecting two docks.

Soaking-tank full of pork cuts on its way from curing cellar to smoke house. On the relatively short haul from curing cellar to elevator, the live tank was pushed by hand.

Food Plants Lag In ACCIDENT PREVENTION

Make less improvement in safety than industry in general

PROGRESS in accident prevention has been slower in the food industries than in industry in general. This is revealed by the 1939 figures on food industry accidents as reported by National Safety Council, Chicago.

Industry as a whole reduced the frequency with which accidents occur by 5 percent and the severity of the accidents by 10 percent in 1939. But the corresponding improvements in the food industry were only 3 and 5 percent, respectively.

Even with this slower improvement, food plants have less serious accidents than other factories. And last year the industry's severity rate was 1.21, which is better than the all-industry severity rate of 1.42. But accidents were permitted to happen more often in food establishments, and the industry's frequency rate stood at 16.70 in 1939 as compared to 11.83 for all industries. Among 30 major industries, food ranged 22d in frequency and 16th in severity.

A long range view of the accident picture reveals that food factories have been way below average in accident curtailment these many years. Frequency rates have been cut 44 percent and severity rates 11 percent during the past thirteen years. But the all-industry improvements have amounted to 69 percent in frequency and 50 percent in severity. Among the various types of accidents, the food industry has made the most progress in the least serious—temporary total disabilities.

This article on

SAFETY

Is important to

All Food Manufacturers

Because it shows a definite need for more effective accident prevention in food plants and because it reveals what causes most of the accidents in the industry. Knowing the causes, management can, and should, take steps to remove those hazards. Greater safety means better employee and public relations.—The Editors.

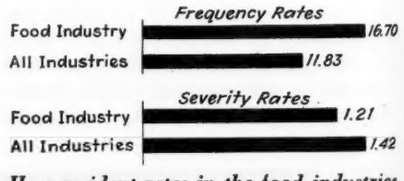
On the whole, the best 1939 safety performances in the food industry were chalked up by the middle-size companies. These averaged 12.80 for frequency, 24 percent better than in 1938—and 0.78 for severity—an improvement of 47 percent.

The most dangerous of the food industries was sugar refining, with 29.25 for frequency and 2.83 for severity last year. The safest in respect to the number of accidents was cereal manufacturing, with an 8.57 frequency rate. But its severity figure was 0.96, or not so good as the 0.29 for "other food products," 0.46 for bakeries and 0.50 for canning and preserving.

Canners and preservers did the most to make their plants safer in 1939, reducing the frequency by 39 percent and the severity by 30 percent over 1938.

National Safety Council gives six food companies a pat on the back for the best all-time no-injury records known to it. Believe it or not, Peter Cailler Kohler Swiss Chocolates Co., Inc., Fulton, N. Y., operated from January, 1936, to February, 1938—3,904,841 man-hours—without a disabling injury. Kellogg Co., Battle Creek, Mich., did all right, too. It operated 1,159,776 man-hours without an injury. And the no-injury record of the eastern division of General Mills, Inc., Buffalo, is not at all bad—1,101,622 man-hours. Nor that of H. J. Heinz Co., Pittsburgh, Pa.—1,084,395 man-hours. Atlantic Sugar Refineries, Ltd., St. John, N. B., did well with 734,528 man-hours; and Bowman Dairy Co., Columbia Ave. plant, Chicago, with 520,320 man-hours. Each of these companies was tops in its respective industry.

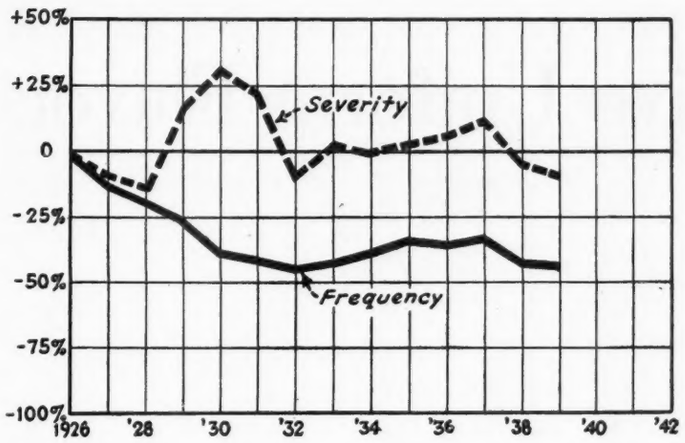
What causes most of the accidents in food plants? Of 196 serious injuries, machinery caused 68, vehicles 26, boilers (pipe and pressure apparatus)



How accident rates in the food industries compare with the average for all industry. More accidents happen in food plants, but they are not so severe.

Disabling Injuries in the Food Industry in 1939, by Industrial Groups.

Industrial group	No. of industrial units	Man-hours worked (thousands)	Average number of employees	No. disabling injuries: Death and perm. total	Perm. Partial	Temporary total	Total	Time charges: Death and perm. total	Perm. partial	Temporary total	Total	Injury rates: Frequency	Severity
ALL groups	402	210,998	108,515	13	179	3,332	3,524	78,000	121,621	56,301	255,922	16.70	1.21
Cereal manufacturing	12	11,317	5,810	0	5	92	97	0	8,500	2,341	10,841	8.57	0.96
Corn products	10	15,985	6,838	1	14	158	173	6,000	5,844	3,725	15,569	10.82	0.97
Bakeries	27	12,383	5,709	0	5	149	154	0	2,775	2,975	5,750	12.44	0.46
Milling	66	12,476	5,763	0	10	176	186	0	8,896	3,097	11,993	14.91	0.96
Canning and preserving	132	18,414	15,412	0	11	264	275	0	5,150	4,105	9,255	14.93	0.50
Confectionery	10	7,536	4,153	1	5	136	142	6,000	2,700	1,607	10,307	18.84	1.37
Dairy products	48	40,207	23,590	5	97	756	858	30,000	67,386	16,457	113,843	21.34	2.83
Beverages	13	9,345	5,296	1	9	213	223	6,000	6,535	2,774	15,309	23.86	1.64
Sugar refining	13	17,433	7,996	5	21	484	510	30,000	13,085	6,328	49,413	29.25	2.83
Other food products	21	13,198	7,453	0	1	265	266	0	600	3,219	3,819	20.15	0.29



The trend in safety in the food industry. While frequency and severity rates have improved in the last two years, they are no better than in 1932.

14, mechanical power transmission apparatus, hand tools, elevators and hoisting apparatus 11 each, working surfaces (ladders, scaffolds, floors, etc.) 10, conveyors 10 and other, unclassified, agencies 35.

The principal way in which employees were injured was by getting their hands and other parts of the body caught in between moving machinery and equipment. Such accidents often occurred when employees were cleaning, repairing or adjusting equipment or performing other special duties involved in the operation of equipment.

Other important causes of accidents were "falling, sliding and flying objects" and "striking against."

Why did these accidents happen? The figures show that unsafe processes, working methods and planning and poor housekeeping were the principal mechanical causes in 30 percent of the serious accidents. Take, for instance, the case of the luckless employee who met an untimely end when he was caught between two railroad cars. He was killed because a definite procedure was not established for coordinating the coupling of the cars with the application of the brakes on the rear cars.

Improper guarding was only slightly less important as a cause of serious injuries. One foreman is minus a leg because a guard over a conveyor was not properly secured.

The third most frequent mechanical cause of serious injuries was defective agencies, such as poorly designed and constructed machinery and worn or broken tools. A fireman's wife is a widow because of a defective boiler.

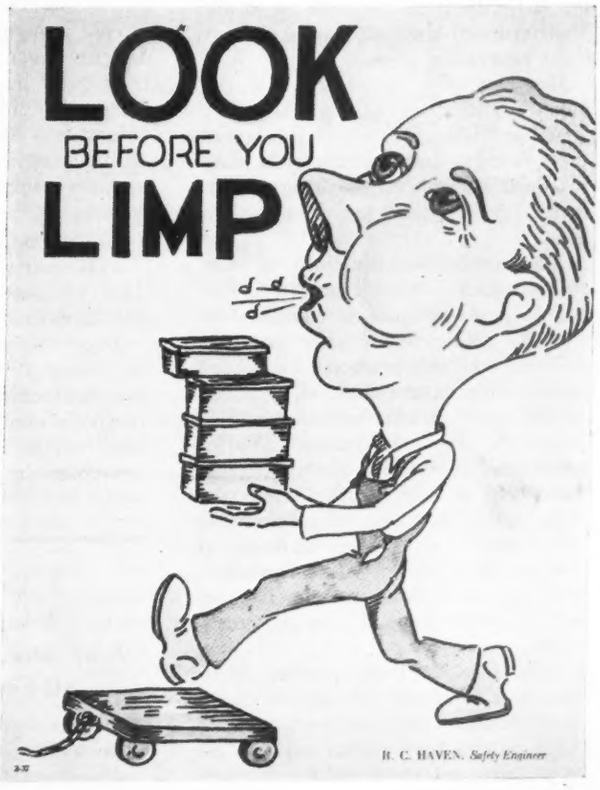
Among the personal causes of serious injuries, improper attitudes—such as disobedience to instructions—recklessness and abstraction were easily the outstanding factors. An engineer entered a pit in violation of the safety rules and suffered a permanently disabled foot when it was caught in moving machinery. Another man lost a leg partly due to abstraction over financial difficulties. He approached a revolving locomotive crane without realizing it was in motion and was caught.

Square on the shoulders of management rests one-fifth of the serious cases—those due to unawareness of safe practices and lack of job training and skill. A new employee lost a finger in the rolls of a machine because he did not know the safe way to clean it.

Unsafe acts by employees cause many serious injuries. Working on machinery in motion is a common mistake. Failure to stop conveyors, mixing machines and similar equipment before cleaning, oiling, and so forth, was reported very frequently. Quite often injury results from assuming an unsafe position, such as standing under a load suspended from a crane. Another cause is gripping, holding, lifting and otherwise handling materials and tools unsafely. More than one man has crushed a finger because he had his hand under the edge of a barrel when setting it down. Another mistake employees frequently make is to use unsafe machinery or tools, or the wrong tool for the job. They also use their hands when they should use tools. Yet another type of error that causes many accidents is starting, stopping, operating or otherwise using equipment without authority, without giving or getting the proper signal, or failing to tag, lock, or block vehicles, switches and similar equipment against unexpected motion, flow of electric current, and so on. One truck driver caused the death of another by turning on the ignition while the truck was in gear. The vehicle moved and pinned the other driver against a steel shelf.

Agencies Which Cause Most of the Injuries

Agency	No. of injuries
Total	196
Machinery	68
Vehicles	26
Boilers (pipe and pressure apparatus)	14
Mechanical power transmission apparatus	11
Hand tools	11
Elevators and hoisting apparatus	11
Working surfaces (ladders, scaffolds, floors, etc.)	10
Conveyors	10
Not otherwise classified	35



Thoughtlessness causes many plant accidents. And here is a plant safety poster designed to make employees be more careful. It was used by Continental Baking Co.

Spice Oils Give Uniform Flavor

*Experience in replacing dry spices for pickle manufacture with spice essential oils and oleoresins shows advantages of these liquid flavoring materials.**

By ARTHUR H. DOWNEY
Technical Director,
Magnus, Mabee & Reynard, Inc.,
New York, N. Y.

PURCHASES of dry spices for pickle making appear to be made without any thought about how much of the individual spices are present in the mixture and with not much thought about their quality. The result is lack of uniformity as well as lack of sufficient flavor in the pickles made with such spices.

If dry spice mixtures are to be used, more attention should be paid to the mixture than is usual; spices of choice grade are preferred. If necessary to get desired results, users should mix their own spices. After a mixture, which gives pickles a flavor liked by consumers, has been found every effort should be made to maintain that flavor by sticking to the procedure which gave the characteristic flavor. Care should be taken to keep the salt content of the brine up to the predetermined standard during the various processing steps.

However, dry spices are not the ideal flavoring agent because: (1) They introduce foreign substances such as mold and bacteria; (2) they are quite variable in flavoring intensity; (3) they have low solubility in brine.

Microscopic examination of dry spice particles shows that the flavoring part of the spice is contained in tiny oil cells. These cells are surrounded and well protected by a hard cellulose-like fiber and the oil or flavor of the spice cannot become available unless the cells are disrupted. To increase the availability of these flavor-imparting oils by removal from the cells and fiber involves considerable effort and an expenditure of funds for processing equipment. Nevertheless, removal is obtained commercially by steam distillation and gravity separation.

Oils heavier than water—oils of cassia, cloves, and pimento—settle to the bottom of the condensed distillate. Oils lighter than water, such as oils of nutmeg, coriander and many others, rise to the top of the condensed distillate. Either by drawing off at the bottom or by drawing off at the top, the spice oils are separated from the water layer. The separated oils are identified as "essential oils" and are microbiologically pure and stable. The molds, yeasts and bacteria with their enzymes were destroyed by the high temperature of the steam and left behind in the still residue.

Although dry spices do not run uniform in their oil content the comparison in the table will illustrate the difference in quantities used to obtain the desired flavor effect. These proportions must be carefully kept in mind when changing dry spice flavoring values into terms of spice essential oil flavoring.

Spice essential oil flavoring is ideal because:

1. The taste and odor is uniform;
2. Blending of different oils can be done without difficulty to obtain variable flavoring effects.

They do have the shortcoming of not being soluble in brine. Probably for that reason they were not as extensively used in the past as they are used today. Now such troubles are overcome by the preparation of an emulsion or of a colloidal suspension.

In the case of flavoring with dill weed oil, a satisfactory emulsion or colloidal suspension is made by grinding 3½ oz. of dill weed oil with 1 oz. of a gum emulsifier in a mortar with a pestle and by making up to 1 pt. with water and vigorous stirring. Beating for a few minutes with an egg beater helps. Two ounces of the emulsion flavors one barrel of pickles carrying 15 to 18 gal. of brine.

Other methods used to get dill weed oil into brine include: (a) using ethyl alcohol as a solvent, (b) using salt or sugar as a carrier. One pound of dill weed oil made up to 1 gal. with

This article on
FLAVORING
Is of interest to
All Food Manufacturers

Because it shows how uniformity of flavor can be obtained through the use of standardized flavoring agents in place of natural untreated flavoring materials.—The Editors.

Table of Spice Essential Oil Equivalents.*

Quantity of dry spice	*Spice*	*Equivalent quantity of spice essential oil*
100 lb.	Allspice	3 ½ lb.
100 lb.	Almond, bitter	½ lb.
100 lb.	Bay leaves	2 lb.
100 lb.	Black pepper	1 ½ lb.
100 lb.	Black pepper	Oleoresin 6 lb.
100 lb.	Angelica root	¾ lb.
100 lb.	Angelica seed	1 lb.
100 lb.	Anise star (Chinese)	3 lb.
100 lb.	Basil, sweet	1 2/5 oz.
100 lb.	Calamus root	2 ½ lb.
100 lb.	Caraway seed	5 lb.
100 lb.	Cardamom seed	5 lb.
100 lb.	Carrot seed	2 lb.
100 lb.	Cassia cinnamon	1 lb.
100 lb.	Capsicum	Oleoresin 8 lb.
100 lb.	Celery seed	3 lb.
100 lb.	Cinnamon, Ceylon	1 lb.
100 lb.	Cloves	17 lb.
100 lb.	Coriander seed	½ lb.
100 lb.	Cumin seed	3 lb.
100 lb.	Dill seed	3 ½ lb.
100 lb.	Dill weed	½ lb.
100 lb.	Estragon	½ lb.
100 lb.	Fennel seed	5 lb.
100 lb.	Garlic	Imit. flavor 4 oz.
100 lb.	Ginger	Oleoresin 10 lb.
100 lb.	Horse radish	Imit. flavor 1 oz.
100 lb.	Laurel leaves (distilled) (bay leaves)	2 lb.
100 lb.	Lavage root	½ lb.
100 lb.	Mace	12 ½ lb.
100 lb.	Marjoram, sweet	½ lb.
100 lb.	Marjoram, wild	2 lb.
100 lb.	Mustard seed	¾ lb.
100 lb.	Nutmeg	12 ½ lb.
100 lb.	Onion	Imit. flavor 4 oz
100 lb.	Paprika	Oleoresin 8 lb.
100 lb.	Parsley seed	3 lb.
100 lb.	Pimento berries	3 ½ lb.
100 lb.	Sage	2 lb.
100 lb.	Thyme	2 lb.
100 lb.	Valerian root	1 lb.

* *When compared with best grade of dry spice.*

* Based on a paper read before the Technical School for Pickle and Kraut Packers, Michigan State College, East Lansing, Mich., February 22, 1940.

Forty acres of cultivated dill weed. Farming research, proper feeding and correct irrigation contribute to the quality of the herb, from which is distilled prime oil of dill weed.

the alcohol may be used on the basis of 2 to 4 oz. of the solution to 15 to 18 gal. of brine; enough for 1 bbl. of dill pickles. Or ½ oz. of the dill weed oil mixed thoroughly with 1 lb. of salt or sugar will flavor a barrel of dills. In neither of these alternative procedures are the results as satisfactory as when the emulsion is used. Addition of the solution or the flavored carrier to the brine results in the oil being released with a varying degree of flavoring effectiveness. The emulsion method can be used quite successfully regardless of whether the pickles being made are genuine or processed dills.

Real accomplishments can be obtained with sweet pickles. Efforts to get the spice oils to dissolve in a water, vinegar, and sugar solution are much more satisfactory than in the case of salt solutions.

Sirups made with sugar and water help in the dissolving, especially when the oils are first dissolved in ethyl alcohol, which is fully soluble in the sirup. The oils are fully soluble in 95 percent alcohol solutions.

Since the flavor of practically all sweet pickle blends is primarily obtained from clove oil, cassia, cinnamon oil and allspice or pimento oil, a variety of flavor effects are to be had by varying the proportions of each of the oils in the different blends. Sometimes small quantities of other essential oils are added to give increased aroma or odor value. As an example, 1 oz. of orange oil may be added to each pound of the spice oil blend; or lemon oil, nutmeg oil, thyme oil, cardamom oil or coriander oil may be used instead. Some blends even contain small quantities of ginger oil.

Since the spice essential oils are soluble in each other, there is nothing to prevent the making of an individual and characteristic flavor with which to attract and hold customers in a consuming market.

In a few isolated cases the oil contained in the dry spice does not represent the flavor of the whole spice. The outstanding instances are black pepper and ginger root. Some of the flavor of these spices is contained in the resin while the odor or aroma is contained in the oil. To get the full flavoring content of these spices they are extracted with a solvent instead of being steam distilled. The resulting extract after removal of the solvent by low temperature or vacuum evaporation is known as the oleoresin of that spice. An oleoresin contains the flavor and odor imparting constituents of the spice.

When acetone is used as the solvent, as recommended in the "Eighth United States Pharmacopoeia," the resulting extract products are miscible with spice essential oils and work into flavoring mixes without difficulty. However, oleoresins do not make satisfactory emulsions unless other spice oils are first mixed with them in quantities greater than those of the oleoresins used.

Following is given an example of how spice oils can be used in pickle manufacture, in this case in the making of genuine dill pickles. The example reviews the regular procedure for making genuine dill pickles. Of course, the strength of the salt solution will vary in different localities, but the example is typical.

Procedure for Making Genuine Dill Pickles

Typical Method

Remove head from a thoroughly cleaned and washed barrel.

Throw in handful of dill weed, put in from 5 to 5½ bu. of cucumbers, and spread about 1 lb. of dry spices on top of cucumbers.

Replace head of barrel.

Lay barrel on its side, remove the bung and fill with 32 to 35 salometer brine. The brine will likely vary in salt content in different parts of country.

Permit fermentation to proceed and replace lost brine daily. Fermentation will usually be complete in about 10 days in regions having warm weather.

After fermentation ceases, the bungs are replaced and the barrel of pickles stored in refrigerated warehouses if they are to be kept in stock. Sometimes they are held for a year.

During the elapsed time the brine slowly dissolves some of the oil from the dill weed and brings it in contact with the outside of the pickles from where it may eventually penetrate into the pickle.

Use of Spice Oil to Replace Dill Weed

By using an emulsion of dill weed oil, the flavoring of the pickles will take place in a considerably shorter length of time.

From the beginning the emulsion will impart a dill flavor to the brine. As the brine penetrates into the cucumber during fermentation, the dill flavor will also be carried in and with probably deeper penetration than is the case when the dill weed itself is used.

At one time genuine dills did not contain any flavor other than that of dill weed. Today many packers use spices to get variations in flavor. In such instances spice oil emulsions can quite readily be used instead of the dry spices that may be added. Care must be taken not to over-flavor. After the amount of spice oil needed has been calculated on the basis of dry spices used, the quantity used should be half of the calculated amount. The spice oils are more quickly available to the pickles than when dry spices are used.

What the Public Thinks About Advertising and Loss-leaders

Consumers have some erroneous ideas that manufacturers ought to correct. And they are wise to loss-leaders

By DICKSON HARTWELL
Hartwell, Jobson & Kibbee, New York, N. Y.

PUBLIC OPINION regarding advertising in general and food advertising in particular was revealed through questions asked by the research department of Hartwell, Jobson & Kibbee, New York, in a personal interview study conducted for FOOD INDUSTRIES. What the housewife thinks of loss-leader selling was also determined.

Apparently the public has less fault to find with advertising in general than with the advertising of certain industries or the advertising of certain products. Tabulated in Table I are the answers to three questions: (1) In general, is advertising a desirable or undesirable thing? (2) Is advertising of food products a desirable or undesirable thing? (3) Is advertising of drugs and cosmetics a desirable or undesirable thing? Only 6.8 percent of those interviewed held that advertising in general was undesirable. However, a larger percentage considered food advertising undesirable. Even so, the percentage objecting to food advertising is smaller than might be expected in view of the mass of criticism of food advertising made in print and before organizations of women consumers.

The three preceding questions were cross-checked to determine any difference in opinion according to sex, geographic location or income. A much larger percentage of the higher income groups were favorable to advertising in general than was the case with the lower income groups. The C income group, or lower middle class, was most favorable to cosmetic and drug advertising. The lowest and highest income groups indicated most disfavor toward drug and cosmetic advertising. The responses to the question regarding food advertising indicated no difference of opinion according to differences in income.

The Middle Atlantic States were consistently more favorable to advertising, whether general, food, or drug and cosmetic, than were people in the Midwest. The New England States favored advertising the least. Sex was not a factor in influencing opinion regarding advertising. No differences according to sex appeared regarding any of the three questions asked.

Some consumers believe that about 10 percent of the food dollar goes for advertising. Manufacturers should correct this erroneous idea.

The drug and cosmetic industry was included in this study because of the association of foods with drugs and cosmetics under the pure food and drug laws. It should be both heartening and disheartening that food advertising has the degree of acceptance it has. However, the fact that only half of those interviewd had a good word for drug and cosmetic advertising and also that more than a fourth believed this advertising objectionable would indicate that much of the dissatisfaction with advertising is centered on the advertising of the food industries "legal associates," drug and cosmetic industry advertising.

This study of consumer opinion of the food industry and certain of the industry's trade practices was made by interview. The sampling was done in representative urban centers, both large and small, geographically distributed throughout the area east of the Mississippi. The sample was sufficiently large to permit questions revealing why those interviewed considered advertising desirable or undesirable. The results of these questions are tabulated in Tables II and III. Those who approved advertising did so largely because they believed advertising brought advantages to the purchaser. The advantages to consumers most frequently mentioned were: "It aids in selection of goods." "You can depend upon advertised goods." "It lowers prices." "It raises the quality of goods." It is somewhat surprising that as large a portion as a fourth of those who approved advertising in general did so not because of advantages gained for themselves, but because of the advantages to the advertiser. Their attitude was explained by the comment: "Advertising sells goods." "Advertising gets products before the public."

The few who believed that advertising benefits for the foregoing reasons were probably thinking of themselves and their own security, whether they were engaged in industry or in advertising. This was revealed by their comments: "Advertising helps business." "Advertising creates jobs." It is significant that very few of those interviewed were without opinions regarding the advertising of the food industries. It is also significant that more of those interviewed believe in the advantages of advertising to the purchaser in the case of food advertising than in the case of drugs and cosmetic advertising or advertising in general. The reasons most often assigned for believing advertising benefited the buyer were: "It raises the quality of goods." "It lowers prices." "You can depend on advertised goods." "It aids in selection."

Tabulation of the reasons why those interviewed objected to advertising appears in Table III. It would seem apparent that most of the objectors were thinking of themselves and their own pocketbooks if their comments are a fair guide: "Advertising creates an over-demand, thus raising prices." "Advertising is misleading, untruthful." "I dislike advertising." Only a few objectors took an abstract viewpoint. They condemned advertising because: "It gives big companies an unfair advantage."

As shown in Table I, four-fifths of those interviewed believe food advertising beneficial, and three-fourths of these believe that the consumer is benefited. It is, therefore, somewhat

Women are wise to loss-leaders. They know they pay the difference on other items. Though most women don't like loss-leaders, some sharpshooting shoppers take advantage of them.

surprising to find that many of these same people believe they are benefited in spite of their conviction that advertising raises the cost of foods. This fact is borne out in Table IV, which indicates that approximately 60 percent of all people interviewed believe advertising "makes food cost more."

The next question, "How much of your food dollar goes to pay for advertising?", brought forth a wide range of opinions. The average of the estimate as to the percentage of the food dollar required to pay for advertising was 10 percent. Cross-checking these results with the answers to previous questions showed that those who believe that advertising raised ultimate prices ventured an average opinion that advertising took 11½ percent of their food dollar, while those who thought that advertising lowered consumer prices believed that only 6.3 percent of their budget went for advertising.

Two related facts brought out by this study merit the reflection of those food companies with an investment in advertising. Fifty percent of the food buyers who expressed an opinion believe that food advertising represents as much as 10 percent of the food dollar. In spite of this belief, 77 percent of the people approve of food advertising. What would be the reaction if consumers were made aware of the actual economic effect of food advertising on the food dollar? This circumstance is worth more than the passing thought of manufacturers whose sales depend on advertising.

Loss-leader selling is closely associated with advertising in the minds of consumers, as it is in fact. Loss-leaders are designed to create traffic through price concessions on a limited number of products. Unless consumers are informed through advertising, traffic is not stimulated.

The public's opinion on loss-leaders was measured by the following question: "Are sales which offer goods below cost desirable or undesirable in general?" The answer to this question indicates that the public does not approve of loss-leader sales. Only 29.8 percent of those interviewed consider sales below cost desirable. Sixteen and four-tenths percent were on the fence, and the remaining 53.6 percent objected to the practice of offering loss-leaders as bait (Table V).

The public appears to be better informed on the practices of selling below cost than on any of the other practices in the complicated structure of food distribution. This fact is indicated in Table VI, which is a tabulation of the replies of all those interviewed to the question: "How does the dealer make up the losses caused by sales below cost?" More than half of those interviewed held a worldly viewpoint. They knew that they paid for the losses in any of many ways, such as short weight or lower quality, but mostly through higher prices in other commodities. Very few believed in fairies to the extent of believing that sales were never made below cost. Approximately a fifth of those interviewed believed that theory actually works in practice—that the losses from sales below cost are more than covered by profits on increased sales of other products. Only 10 percent of those interviewed were in a fog on this issue. Cross-checking replies to this question reveals that more than half of those who consider loss-leader selling undesirable believe losses are covered by higher prices on other items. The 10 percent who believe that loss-leaders are desirable even though prices are raised on other items probably are "shoppers" who know values and sharpshoot the loss-leaders.

Table I—In general, is advertising a desirable or undesirable thing? Is advertising of food products a desirable or undesirable thing? Is advertising of drugs and cosmetics a desirable or undesirable thing?

	Advertising in general (percent)	Food advertising (percent)	Drug & cosmetic advertising (percent)
Desirable ...	82.6	80.2	51.2
Undesirable..	6.8	11.0	27.8
Neither	4.4	3.6	4.0
Don't know..	6.2	5.2	17.0

Table II—Why is advertising—in general, of foods, of drugs and cosmetics—desirable?

	Advertising in general (percent)	Food advertising (percent)	Drug & cosmetic advertising (percent)
Effect on consumer	53.8	77.0	68.9
Effect on advertiser ..	27.9	14.0	8.6
Effect in general	13.7	3.6	10.7
Don't know..	4.6	5.4	11.8

Table III—Why is advertising—in general, of foods, of drugs and cosmetics—undesirable?

	Advertising in general (percent)	Food advertising (percent)	Drug & cosmetic advertising (percent)
Effect on consumer ..	88.4	89.5	85.3
Effect on advertiser ..	....	....	....
Effect in general	9.3	8.8	10.7
Don't know..	2.3	1.7	4.0

Table IV—Does advertising make foods cost more or less in the long run?

	(Percent)
Makes foods cost more.....	59.0
Makes foods cost less.....	16.8
Neither	13.6
Don't know.....	10.6

Table V—Are loss-leaders desirable or undesirable in general?

	(Percent)
Undesirable	53.6
Desirable	29.8
Neither	6.4
Don't know.....	10.0

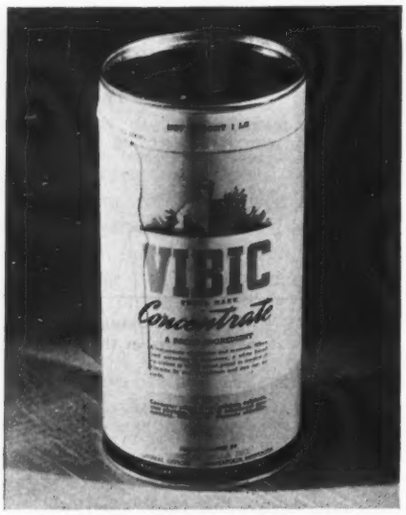
Table VI—How does the dealer make up losses caused by sales below cost?

	(Percent)
Prices are raised on other items....	50.5
Increased sale of other goods.....	19.3
Raise prices of sale items at other times	4.8
Lower quality goods on sale, sell seconds	4.1
Short weights and measures.....	1.3
Goods never sold below cost.....	3.8
Losses never made up.....	2.5
Miscellaneous	2.3
Don't know.....	11.4

Hints and Hurdles

Consumers Get Unexpected Answers to Demand

ASK organized consumer groups their grievances against manufacturers of food and the answers will cover a wide range of imaginary as well as existing abuses; often a rare or occasional departure will be used to damn all processed foods. The answers to such a question will include: "Prices are too high." "Loss leaders are bait." "We want foods, not premiums, for the



food dollar." "Packages are clumsy and hard to open." "Food advertising is exaggerated and untruthful, and adds to the cost of food." "Food plants are insanitary." Most replies would headline "white flour" and would contain accusations against it ranging all the way from "fraud" to "mass murder of the nation."

Organized consumer groups are demanding wheat bread and pastry containing all nutrition found in the grain. The fact that whole wheat is semiperishable and involves difficult processing problems is not to be considered. The lack of a national market demand is of no consequence. The probability that consumers in general would not eat whole wheat bread and pastry if they had it is beside the point. The fact that they would not pay the price if they could get what they think they want is also out of bounds.

Organized consumers have demanded the nutritional values of the wheat grain in bread and pastry and they expect to get these values in products made of whole wheat. And at last decades of crusading are to be rewarded in substance—but not in form. The rewards, however, are beyond the militant crusader's dream.

Consumers will soon be able to get from wheat bread and pastry all the nutritional values contained in the unprocessed grain. They won't, however, have to forego white bread or white pastry—the undisputed national preference—nor will they have to forego a change in appearance, texture or flavor. Neither will they have to pay the price they would have to pay if they acquired what they think they want.

The answer to consumers' "attitude" toward "white flour" is two new products. One is a white flour which is the nutritional equivalent of unprocessed wheat. The other is a concentrate which may be added by any baker to bring to grain-wheat-nutritive-value the white flour he now uses. These two, "Vibic" flour and "Vibic" concentrate, are products of General Mills, Minneapolis, Minn. They have the approval and will bear the seal of the American Medical Association.

A sturdy prop has been knocked from under the consumer's house. It will be interesting to observe the support which takes its place—probably a victory cry "I told you so."

Domestic Quick Freezing Unit

A NEW quick freezing unit, recently placed on the market, is designed for freezing as well as storing frozen foods in the home. The one-barrel capacity unit is filled and emptied from the top to sustain minimum loss of freezing effect. The unit or "well" has a high ratio of freezing surface to cubic capacity. The refrigerant Freon circulating between two vertical cylinders comes in contact with the 24 sq. ft. of wall of the interior well. Insulation is on the outside of the outer cylinder. The "Deep Freeze" domestic unit is designed to meet the home storage needs of locker plant patrons and also for the quick freezing of farm produce for home consumption on the farm. There are other potential markets. When the purchase of large quantities of cut meats at wholesale becomes practicable in urban centers, this type domestic quick freezing unit may become an urban utility. Frozen fruits and vegetables would also be bought in institutional packages or quantity lots rather than in consumer packages. Possibly also when the market demand for frozen food is appreciably greater than at present, a series of this type of frozen food storage units may appear in super-markets offering packaged frozen merchandise on a self-service basis.

How-to-use Promotion

AMERICAN Bottlers of Carbonated Beverages plans an educational promotional program which will provide housewives with information on how to use the product. This program will furnish recipes for novel kinds of punch, frozen desserts and even salads using carbonated beverages. This promotion should be successful. There are ample case histories, including that of the "Toll House" cookie episode, to establish the value of sound, foolproof recipes which produce a favorable taste reaction.

Raw Values in Refined Products

As the result of great strides forward in the scientific investigation of nutrition, there has been an increased organized consumer group pressure on food manufacturers for processed foods with the food values of raw unprocessed foods. Among the refined foods derived from raw foodstuffs high in mineral and nutritional values is sugar. With the introduction of a new product, "grans", National Sugar Refining Co. of New Jersey offers a "raw cane sugar . . . with all the mineral and organic elements which were present in the raw sugar . . . with impurities removed." Grans, cream-colored, both a table and cooking sugar, pours easily, never lumps, dissolves quickly.

New Packages & Products

Drying Cuts Distribution Cost

The trend toward reducing the distribution cost of processed foods through the removal of water is constantly evidenced by the introduction of new concentrated products. Among those of recent origin is "M.C.P." powdered lemon juice, product of Mutual Citrus Products Co., Anaheim, Calif. Three ounces of M.C.P. powdered lemon juice equals the juice of six average lemonds. Corn sirup is present in the powder, this ingredient being added in quantity "just sufficient to facilitate drying."

Washable Label for Sirup

The permanent, washable, fused- or burned-on label is finding increasing application on glass containers for foods which have a long pantry shelf-life. Among the products for which such containers find application are sticky liquids and those which discolor the label. "Pennant" waffle sirup, product of Union Starch & Refining Co., Columbus, Ind., has recently been introduced, packaged in glass with a permanent label, the result of ceramic paints applied to the bottle and baked into the glass. Also baked on the bottle is a washable rear panel carrying a recipe for making waffles.

New C. D. Kenny Co. standardized salesmen's coffee and tea route sedan delivery truck. The body is vermilion; the panel, cream; and the hood and all fenders, black. When marred or damaged, black fenders can be repaired and repainted at a minimum of expense and show no difference in color at the points repainted. The panel lettering is the same for all Kenny branches. The branch location and local address is placed on each cab door.

Salesmen's Cars Dressed Up TO INCREASE SALES

Before-and-after illustrations indicate changes to improve consumer appeal

IN the wide distribution of food products such as groceries, teas and coffees, the consumer appeal of the salesmen's passenger cars or sedan delivery trucks is an important factor in increasing sales. Uniformity of design and its practicability from a maintenance standpoint are also important considerations affecting sales and vehicle repainting expense.

An excellent example of how one company in the food field has solved these problems is told in the text and illustrations on this and the opposite page. The company is the C. D. Kenny Co., Baltimore, Md., a wholesale grocer with 42 branches in the states of Maryland, New York, Indiana, Ohio, West Virginia, Virginia, North and South Carolina, Tennessee, Georgia, Arkansas, Alabama, Louisiana, Florida and the District of Columbia.

Before the Kenny company made a concerted effort to take advantage of the sales value of its salesmen's passenger cars and small delivery trucks, there was little or no uniformity in the appearance of the vehicles. They were painted in all manner of colors and lettered in all manner of ways.

While the basic color combination of the company's larger, regular delivery trucks was cream and vermilion, these colors were not always employed on the salesmen's cars. Sometimes in the need for putting a new car to work immediately, stock cars were taken from the dealer's floor stock in the various Kenny branch cities. Some cars were red; others, blue; and still others, black.

About the only uniformity existing in the previous set-up was the use of a certain few decalcomanias such as the No. 730 coffee bag and the Norwood mayonnaise jar (both Kenny house brands). These were kept in stock at the head office in Baltimore and requisitioned out to the branches as new vehicles were purchased and put into service.

Even with the uniformity of these decals, however, there was no uniformity of application on the vehicles themselves, due to differences in the dimension of the car door sides or the panels of the sedan delivery models. Sometimes these were placed in a vertical position, sometimes on a slant. In some cases they were not used at all but were replaced by hand-painted substitutes of smaller size to fit the areas available.

When the Kenny company name was employed, it was in all sizes and shapes or types of lettering. Some of the sedan delivery trucks were painted all cream, and some all vermilion. Others were painted cream and vermilion and still others black with various cream and vermilion combinations. Fenders were black, cream or vermilion, often as the fancy of the local Kenny branch manager might dictate.

A typical sedan delivery truck such as used by a Kenny coffee and tea route salesman is shown in three of the accompanying illustrations. Body, hood and fenders were vermilion with

the small side panels painted cream.

A hand-painted Kenny seal with old-style script lettering was centered in the panel and flanked on one side by the name of the branch city in which the truck was used and on the other by "Established 1870."

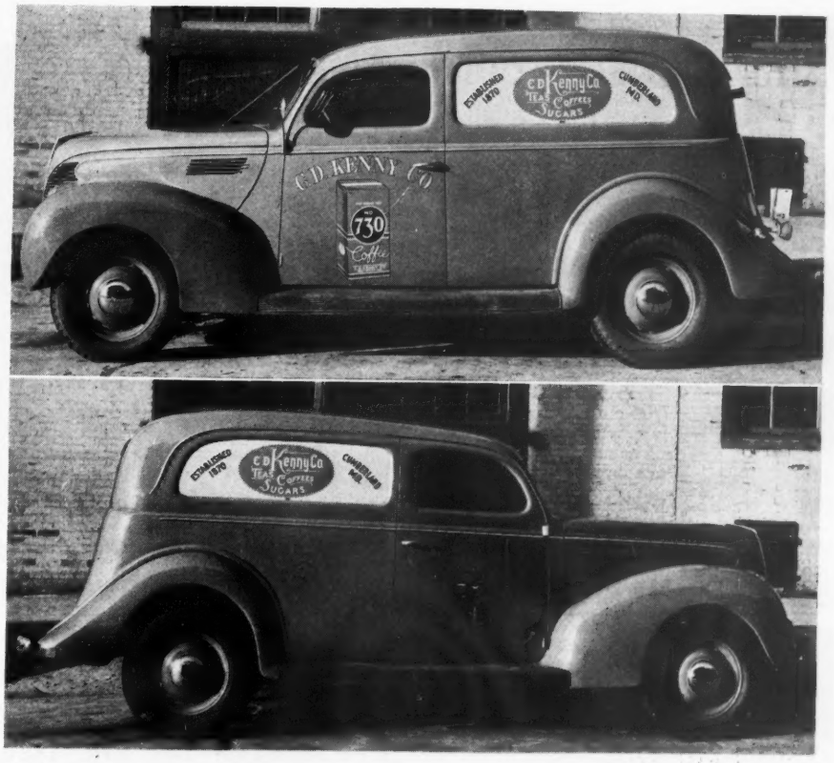
Both cab doors and the rear door had the C. D. Kenny Co. name, but in a type different from that used in the Kenny seal. On the right cab door was a hand-painted Norwood coffee jar. A No. 730 coffee bag decal was on the left door and a Norwood mayonnaise jar on the rear.

To replace such a painting and lettering layout by one which would be uniform in all Kenny branch cities, the first step was the establishment of a set of certain standardized Kenny paint specifications with the Ford, Chevrolet, Dodge and International companies. These specifications were placed on file at all the assembly plants of the above companies and a corresponding supply of paint kept on hand.

Each order for a new truck required that it be painted in accordance with the Kenny specifications on file at the assembly plant of the manufacturer from whom the vehicles were purchased. Done in this manner, the manufacturer made no extra charge for the special Kenny colors. This saved the Kenny company from $20 to $25, the cost of repainting a unit if furnished in other than the Kenny colors.

Each manufacturer supplied the Kenny company with blank outline drawings on which the exact line of demarcation between colors was shown. This assured uniformity at all assembly plants. This arrangement supplied the trucks in the uniform basic colors. The lettering was then done locally in the branch city in which the truck went into service.

The uniformity of lettering was obtained at first by master pounce sheets mailed to the local painters from Baltimore and later by corresponding decals and a standardized layout drawing.



Right and left side views of the previous non-standardized painting and lettering layout on the identical truck shown on the opposite page. The fenders are painted vermilion, a color which is almost impossible to match when repairs have to be made. Note also the spotty brand lettering in place of the institutional Kenny lettering in the new layout.

Before-and-after rear end views of the truck, the old layout being on the left and the new one on the right. In the latter, note particularly the Kenny trademark cup as used on many of the Kenny items. This provides a tie-up between the motor vehicles operated by the company and the food products which it sells.

The Food Industry News

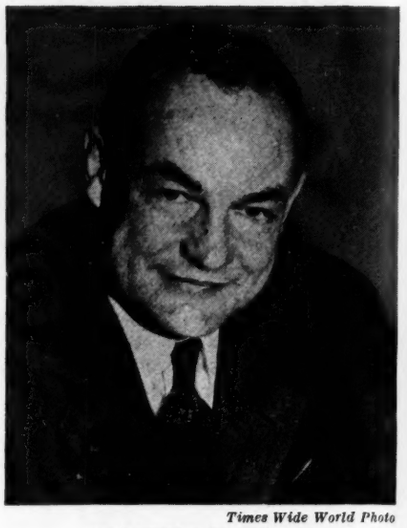
GENERAL NEWS, BUSINESS TRENDS, MEN, JOBS AND COMPANIES • SEPTEMBER, 1940

Attorney General Plans Investigation Of Food Costs in Three Large Cities

"Only a lack of personnel prevents an anti-trust investigation of food costs on a nation-wide scale comparable to that undertaken last year of the building industry." This is an almost exact quotation of the blast from Assistant Attorney General Thurman Arnold on August 13. Mr. Arnold grieves over the great increases in food costs which he says afflict meat packing, bakery products, milk and cheese.

More specific is Antitruster Arnold's promise immediately to proceed in Chicago, Philadelphia and New York to make an investigation of these particular commodities, and probably of the fresh fruit and vegetable industries. Included in the program of investigation are studies of transportation, particularly delivery costs for bakery products, milk and other foods similarly distributed by "monopolistic enterprise." Mr. Arnold promises "a comprehensive prosecution of the restraints of trade which now obstruct the distribution of food in all our large cities."

The cheese probe promised has been more specifically described than any other. It will, according to Mr. Arnold, eliminate the Plymouth cheese market's control of the whole industry. He says that it is not fair that each Friday afternoon cheese prices be fixed by a few people "during a few seconds of shouting not understood by the layman."



Times Wide World Photo

SUCCEEDS WALLACE

Claude A. Wickard, who succeeds Henry Wallace as Secretary of Agriculture. Since he had been Undersecretary, there is expected to be no major administrative changes in his department for at least the remainder of the year. Mr. Wickard came to Washington in 1934 as assistant chief of the corn-hog program of AAA. He has a political background, having served in the Indiana Senate.

Trading Corporations May Supplant Cartel

Statements that the Administration-proposed Hemisphere "cartel" has been abandoned or scrapped do not accurately reflect the true situation of Washington thinking. The original idea, as sprung by the President for effect, of having a single gigantic trading corporation to handle the New World's business with Europe, is out the window, it is true. But those who have the job of attempting to plan for the economic defense of the Hemisphere still look to the creation of trading corporations as one phase of the solution. And efforts to obtain voluntary crop curtailments can be expected to go along with any such setup.

It appears probable, now, that any such trading corporations will be limited to specific commodities and that they will be largely United States operated and financed. That means that in specific instances, U. S. trading groups will move into the South American market and offer to buy with free American dollars commodities which otherwise would have no other outlet than shipment to Europe for blocked marks.

The half-billion dollar increase in the export-import bank credit fits into this picture. Some of this money, maybe most of it, would go to finance any trade groups established. The hope exists, of course, that the South American countries given credits from food purchases would spend those credits with American industry to build up their own national industries.

But Uncle Sam, insofar as the present planning goes, will have no illusions about getting the money back. The expenditure will be considered well worth while as a means of limiting German economic penetration of Latin America even if all the money is lost.

FSA Reopens Canned Fruit Standards; Starts Proceedings on Other Dockets

On Sept. 16 many divisions of the food industries will be in Washington for the reopening of the canned fruit standards case. The purpose will be determination of permissible sweeteners and whether any of them must be declared on the label. This issue was discussed at length in original Docket No. 5 under the Department of Agriculture. Now it is to be reheard practically as a new case under Docket No. 23.

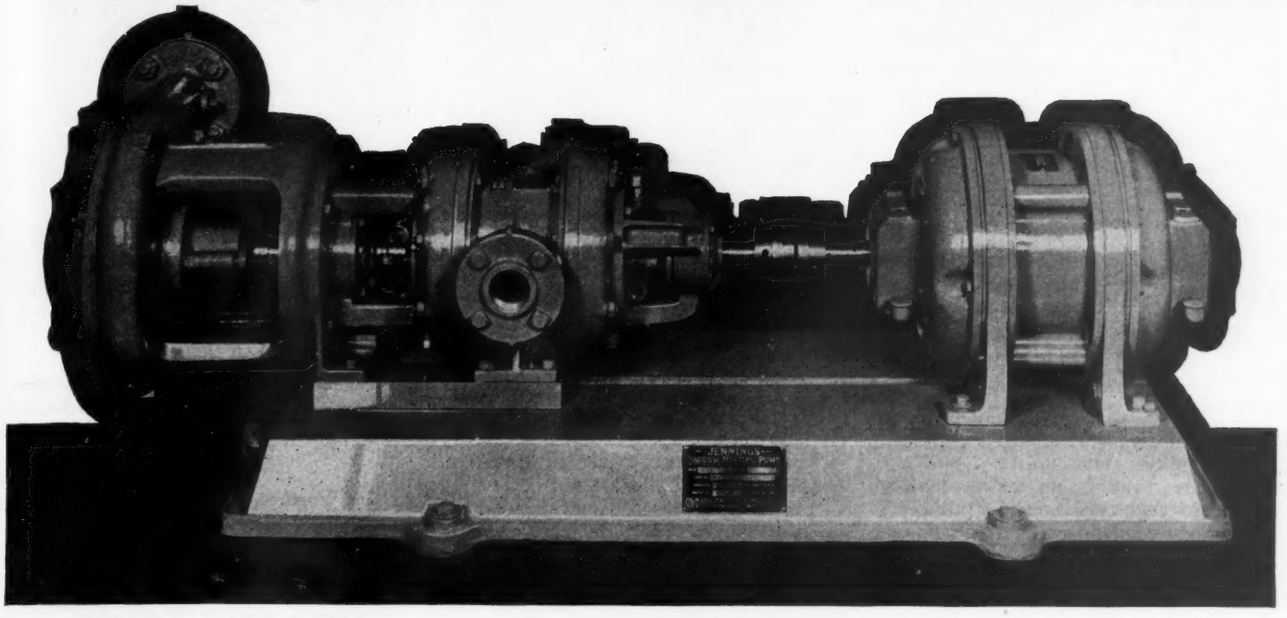
Officials of FSA feel that they are not in a position on the basis of proceedings conducted by others to reach a precedent-making finding. The new hearing, therefore, will be governing not only for canned fruits but will provide a basis for subsequent manufactured-food standards proceedings. Other industries' spokesmen are, therefore, expected to wish some part in the proceedings. This privilege will probably be granted.

Preserve, jelly and fruit-butter standards were expected almost simultaneously with the call for the canned fruit hearing. However, the findings regarding label declaration of sweeteners should not be taken as precedent-making. FSA felt that the preserve industry should have its standards, subject to some chance of modification in a year. They did not want this group to wait several months longer until the sweetener controversy could be heard and settled. The preserve industry has very cordially welcomed this evidence of practical administrative handling by FSA.

Other Standards Plans Are Scheduled

The dried skim milk industry has been demanding that the name of its product be made "milk solids not fat." It objects to any name involving the word "skim." FSA officials have been

Nash—the Perfected Vacuum Pump for Evaporators and Condensers

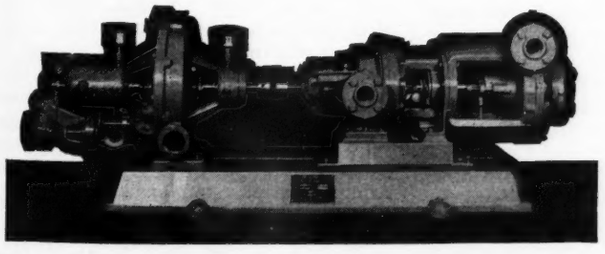


COMBINATION VACUUM REMOVAL UNIT ESPECIALLY DESIGNED FOR SATISFACTORY OPERATION ON CONDENSERS WITHOUT BAROMETRIC LEG

Especially designed for drawing air and liquid from high vacuums, the Nash Vacuum Removal Unit is an efficient combination of a standard Nash Vacuum Pump and a Jennings Centrifugal. This design may be had in either motor or steam turbine drive, and may be installed with confidence that it will operate perfectly.

Nash Vacuum Pumps for Evaporator and Condenser Service offer unusual advantages. Vacuum is non-pulsating, producing uniform operating conditions and assuring a better product. Nash Vacuum Pumps have no valves, gears, pistons, rings, or mechanical complications. The single moving element rotates without metallic contact, and no internal lubrication is required. In standard design these pumps maintain vacuums up to 27" of mercury.

Nash Pumps are compact, and require but a fraction of the space taken by old type equipment. They may be installed where convenient, and they operate at suitable speeds for direct connection to either electric motors or steam turbines. Nash engineers will be glad to recommend proper equipment to exactly meet your particular requirements.



THE NASH VACUUM REMOVAL UNIT MAY BE HAD EQUIPPED WITH STEAM TURBINE DRIVE WHERE THIS TYPE IS PREFERRED

NASH ENGINEERING COMPANY

SOUTH NORWALK · CONNECTICUT, U. S. A.

petitioned to reopen the standard of identity for this change in name. This request was denied. The officials said that there was no reason to believe that there was any new evidence available bearing on this question that was not adequately taken into account in the earlier proceedings under Docket 7-E.

Hearings on flour standards of identity will begin on September 9. An amendment to the tomato catchup standard, permitting the use of sodium benzoate as a preservative, will be considered in hearings commencing on September 11. Some other minor standards proceedings may also start late in the month. The hearings on dietary foods and chocolate products have been rumored as high on the list of prospects. But even those two are subject to some delay.

FSA wishes to concentrate on a few cases and avoid opening too many dockets at once. Particularly, it wishes to postpone hearings on all dockets involving the sugar controversy until after the hearings have been completed on canned fruits. Nevertheless, some of the other cases will probably be opened during early October before even tentative findings are had from the hearings in the canned-fruit case.

Harris & Ewing

CIVILIAN FOOD HEAD

George Livingston, former vice-president of Millers National Federation, who has been handed civilian food problems in the national defense scheme. He heads up the food supply section of Chester Davis' department of the Defense Commission. So far, the job is largely a paper one of cataloging and correlating data on production, processing facilities, supply stocks and distribution of foods, plus development of "if and when" plans to meet a variety of given situations. The quantity of food presents no problem.

US Has Food for World's War Refugees But Blockades Prevent Its Distribution

The European food situation has become so hopelessly tangled up in propaganda, politics and military strategy that there really is no sure, accurate picture of real conditions. Conflicting contentions regarding supplies and potential starvation inevitably must be read against the background of two great forces engaged in a struggle for survival and willing to go to extreme lengths to gain advantage.

Several points can be weeded out of the chaos and stated as facts as of late August and least likely to change. These are:

The United States, teamed with the Red Cross, is ready and equipped to provide huge quantities of food for civilian refugee populations, primarily in Europe but also, perhaps, in China. If sent, these supplies would be largely surplus staples which would provide the greatest dollar aid to farmers. There will be no canned goods under any circumstances (no tin for Hitler).

This government will not, however, bring formal diplomatic or other pressure to bear upon Great Britain to let these supplies go through the blockade. The machinery set up by the President places upon the Red Cross the responsibility of finding adequately safeguarded outlets for American supplies and the government has no plans to formally intervene in that setup.

The British are not expected to relax their blockade at all to permit any supplies to go through to occupied sections of Europe. The chances even of getting minimum food supplies through to unoccupied France are slim. Prime Minister Churchill in his speech to Parliament on August 20 flatly rejected Herbert Hoover's proposal for a relaxation of the British Blockade to permit shipments of American food to the peoples of German conquered Europe this winter.

The only formal request put to Britain by the Red Cross up to mid-August was for permission to send a boatload of milk and food through to unoccupied France solely for children and the sick and wounded, plus, perhaps, some clothing for refugees. If sent, these supplies would be financed with Red Cross, not government, funds, but the British have indicated no willingness to accede to the request.

Relief supplies for China are still in the talk stage. There is willingness from the American end to send help in this direction, but the question of getting supplies past the Japanese and getting assurance they would not be confiscated furnishes a barrier similar to that in Europe. A new possibility for surplus shipments developed late in August, however. The Red Cross started a move to send food to Finland, where 40 percent of the children are said to be undernourished. Canned milk and dried fruit are particularly needed by Finland. This food probably would be transported in Finnish ships.

The Department of Agriculture is awaiting developments in Europe's food blockade before establishing production quotas for agriculture next year.

Beyond these few simple truths all questions of food for Europe are beclouded and all answers are unreliable.

British Combine Photo

THAT BRITAIN MAY EAT

To help solve the food problem of war-battered Britain, householders grow vegetables on gardens or allotments and then preserve them for use next winter. Here a housewife is drying peas and beans in the kitchen range.

Definition for Lard Becomes Effective Nov. 1

Lard and rendered pork fat definitions have been adopted under the Meat Inspection Act by an order of the Bureau of Animal Industry, printed in the *Federal Register* of August 15. This is the result of the hearings held June 18, reported in FOOD INDUSTRIES, July, page 73. The definitions, which are entirely independent of Food and Drug Administration standardization activities, go into effect on November 1. They are:

"(cc) Lard. The fat rendered from fresh, clean, sound, fatty tissues from hogs in good health at the time of slaughter, with or without lard stearin or hardened lard. The tissues do not include bones, detached skin, head fat, ears, tails, organs, windpipes, large blood vessels, scrap fat, skimmings, settlings, pressings, and the like, and are reasonably free from muscle tissue and blood.

"(dd) Rendered pork fat. The fat, other than lard, rendered from clean, sound carcasses, parts of carcasses, or edible organs from hogs in good health at the time

of slaughter, except that stomachs, tails, bones from the head and bones from cured or cooked pork are not included. The tissues rendered are usually fresh, but may be cured, cooked, or otherwise prepared and may contain some meat food products. Rendered pork fat may be hardened by the use of lard stearin and/or hardened lard and/or rendered pork fat stearin and/or hardened rendered pork fat."

Hours Exemption Postponed

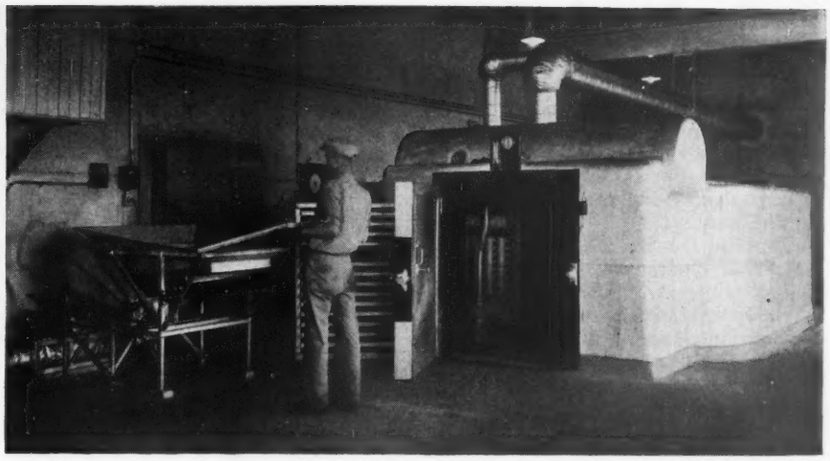
Because of objections filed by labor organizations, the U.S. Department of Labor has postponed final determination of the question of granting fresh fruit and vegetable canning industry an additional hours exemption under the wage and hour law. The AFofL and the CIO filed the objections.

ICC Eases Truck Ruling

Interstate Commerce Commission last month broadened the exemption clause in its rule requiring truck and bus drivers to keep logs of interstate trips, so as to exclude carriers operating in metropolitan areas cut by state lines.

The original exemption affected only drivers in interstate or foreign commerce operating wholly within the limits of a city or "between contiguous municipalities." The changed version excludes from the regulation drivers operating on regular schedules, over regular routes, mainly in urban and suburban areas, and when such regular routes are not more than 35 miles from the terminal to the point of return.

Revision is intended to cover such cases as food trucks which, on regular routes, cross and recross state lines several times a day, and often stop in suburban communities not actually adjacent to the community in which the starting point is located.



Food Industries Photo

QUICK FREEZER GOES INTO ACTION

This new freezing plant was put into operation last month at Bridgeville, Del., by Atlantic Ice Manufacturing Co. A Finnegan unit with a capacity of 1,000 lb. of lima beans an hour, the freezer does custom work for canners in the vicinity. Poultry will be frozen this fall. The produce is frozen loose on trays by a blast of cold air. Then it is passed through a separator (at left) to segregate the individual pieces.

Army Will Distribute Its Purchases So As Not To Disturb Local Markets

Feeding an Army which is expected to expand to three or four times its normal size is not considered so much a problem of arranging for adequate foodstuffs as it is one of so distributing procurement that local markets will not be upset. All planning by the Army and the Defense Commission for the training program is being geared to this fundamental. The theory of the last war that mobilization of a large Army automatically will increase the national food consumption is out the window in present preparations. Instead, plans are being made on the assumption that the problem is solely one of switching the food supplies for, say, a million men, from normal distribution channels to Army camps—and to do this in such a way as to avoid these three things: (1) Interruption in the normal flow of raw materials from the farm to processors and other normal outlets. (2) Bulking purchases so as to rob one locality and leave another glutted. (3) Violent fluctuations in retail and wholesale prices.

George M. Moffett, who is the food adviser for William S. Knudsen, believes the Army ration program can be arranged to avoid all these pitfalls. In the first place, he points out, the Army trainees are to be fed a normal American diet which, in bulk, will approximate what the trainees would be eating at home. Standards of quality and packaging for Army orders will not vary materially from those now used by processors for normal markets. There will be some experimentation in feeding vitamins and minerals, but except insofar as these are now contained in foods on the market, this will be in concentrated doses, by tablet or liquid.

Purchases of foodstuffs will be split between bids and negotiated contracts, and the chief objective will be so to divide up the orders that everyone will share to approximately the extent he would in normal markets. There will be no complex mathematical formula to this, but Mr. Moffett was brought to Washington to see that no one processor or wholesaler gets more orders than he can handle and still supply the normal markets dependent upon him.

Two new policies inauguarated by the Quartermaster General for large quantity purchases are aimed to make this policy work partially automatically First of these involves invitation of bids on f.o.b. factory or plant basis, with the government taking delivery at the plant and paying freight to the point of destination. The second provides for split bidding; invitations will advise bidders of the maximum and minimum quantities which will be awarded and bidders asked to indicate the minimum quantity they will accept. Warning is issued in this announcement that no award will be made to any bidder in excess of the quantity the bidder is capable of turning out with present equipment and normal operation. Mr. Moffett makes a point of this last proviso, urging that food processors not expand plant facilities in anticipation of war orders.

Obviously, both of these innovations will aid smaller processors to compete with larger ones. The first also will serve to insure that orders will be spread out over the entire country—not be bulked in the areas around training camps.

Neither the Army nor Mr. Moffett have yet given concrete consideration to the problems of Army feeding in the event of field operations outside the country. One thing is certain in this connection, however; the Army will get priority on all its needs and, at least until something better comes along, plans to stick closely to its newly developed two-can meal ration in the field. This means that if tin shortages develop, the Army will get first call on its tin can needs.

New Starch Plants Planned

Three new starch factories are to be built soon, one in Louisiana and two in Texas, using a process of extracting starch from sweet potatoes which was developed by the Bureau of Agricultural Engineering and Chemistry. This country formerly imported much of its root starch, and these imports are now reduced or cut off.

Hawaiian Quarantine Eased

Certain Hawaiian fruits and vegetables, entry of which to the continental United States is restricted by Federal plant quarantine, may now come in, provided they have received a treatment under supervision and safeguards against the Mediterranean fruitfly and the melonfly.

Tests by the Bureau of Entomology and Plant Quarantine show that fumigation with methyl bromide will kill the Mediterranean fruitfly and the melonfly in all stages of their life cycles in these fruits and vegetables: guavas, papayas, bell peppers, bitter melons, cucumbers, summer squash, string beans and tomatoes.

Requirements as to the use of the new method involve many details, and those interested may get full information from the Bureau of Entomology and Plant Quarantine, Washington, D. C.

Labor Law Change Unlikely

Hearings before the Senate Labor Committee on Wagner Act amendments brought this issue back into the foreground, at least temporarily, late in August. The committee action, however, is not taken in Washington as materially increasing the chances of passage of any changes at this session. The whole subject is a political hot potato for an election year, and few Congressmen are seriously interested in leading an open floor fight. If the session should continue indefinitely, however, this picture might be altered.

Acme Photo

FARLEY JOINS COCA-COLA

James A. Farley, retiring Postmaster-General and Democratic National Chairman, on September 1 became chairman of Coca-Cola Export Corp. He is in charge of all the export business of Coca-Cola Co. and will have particularly to do with the expansion of business in foreign countries.

Florida Warns Bakers On Dietary Labeling

Florida's Agricultural Department has warned bakers in the state to be careful how they label bread containtain vitamin B_1 and mineral elements. If the article is sold as "bread" (for which there is a definition and standard of identity) no objection would be made to a statement, in type no larger than the smallest reading matter on the label, to the effect that the bread contains vitamin B_1 and minerals (naming them, if desired) equivalent to whole-wheat bread.

But the department would regard such breads as "special dietary foods" if their labeling or wrappers contain statements that will lead purchasers to believe they are getting a food of greater vitamin potency or mineral value than would naturally occur in a bread such as whole-wheat bread. Such statements as "enriched with vitamin B_1", or "extra rich in nutrients," would, in the department's opinion, make the product a special dietary food.

Special dietary foods must be labeled to show their vitamin potency and must show the percentage of each mineral claimed in its quantity or proportion in terms of the element. The label must also carry a list of the ingredients that go into the food.

Schedule of Current Action on Food Standards

(Dockets 1, 2, 3, 4, 5, and 9 have been completed and dropped from this table*)

	Docket number and commodity	Type of standard or regulations	Presiding Officer	A First announced in *Fed. Register*	B Initial hearing date	C Preliminary briefs due not later than	D Examiner's findings published in *Fed. Register*	E Secretary's order published in *Fed. Register*	F Effective date of order
6	Canned peas	Identity, quality, fill	J. M. Fox	Mar. 7, '39	April 17, '39	June 29, '39[1]	Nov. 9, '39[2]	Feb. 24, '40	May 23, '40
7-A	Cream			Mar. 28, '39	May 1, '39	July 27, '39[1]	Sept. 26, '39	July 2, '40	Sept. 30, '40
B	Whipping cream			Mar. 28, '39	May 1, '39	July 27, '39[1]	Sept. 26, '39	July 2, '40	Sept. 30, '40
C	Evaporated milk	Identity	F. S. Hassell	Mar. 28, '39	May 1, '39	July 27, '39[1]	June 4, '40	July 2, '40	Sept. 30, '40
D	Sweetened condensed milk			Mar. 28, '39	May 1, '39	July 27, '39[1]	June 4, '40	July 2, '40	Sept. 30, '40
E	Dried skim milk			Mar. 28, '39	May 1, '39	July 27, '39[1]	June 4, '40	July 12, '40	Oct. 10, '40
8	Canned vegetables	Identity	F. S. Hassell	Mar. 24, '39	April 24, '39	June 19, '39[1]	Aug. 15, '39	Feb. 28, '40[4]	May 27, '40
10-A	Fruit jams	Identity	M. P. Markel	Aug. 11, '39	Sept. 11, '39	Jan. 5, '40[1]	June 25, '40	.....	.....
B	Fruit jellies	Identity	M. P. Markel	Aug. 11, '39	Sept. 11, '39	Jan. 5, '40[1]	June 25, '40	.....	.....
C	Fruit butters	Identity	M. P. Markel	Aug. 11, '39	Sept. 11, '39	Jan. 5, '40[1]	June 25, '40	.....	.....
11-A	Cheddar cheese			Aug. 22, '39	Sept. 25, '39	Dec. 22, '39[1]	.....	.....	.....
B	Washed curd cheese	Identity	W. G. Green, Jr.	Aug. 22, '39	Sept. 25, '39	Dec. 22, '39[1]	.....	.....	.....
C	Colby cheese			Aug. 22, '39	Sept. 25, '39	Dec. 22, '39[1]	.....	.....	.....
12	Cream cheese	Identity	W. G. Green, Jr.	Aug. 22, '39	Oct. 2, '39	Feb. 5, '40[1]	.....	.....	.....
13	Coal-tar colors[3]	Listing and certification	F. S. Hassell	Oct. 20, '39	Nov. 20, '39	Dec. 22, '39[1]	Feb. 6, '40	Mar. 23, '40	June 20, '40
14	Coal-tar colors[3]	Listing and certification	F. S. Hassell	Feb. 6, '40	Mar. 11, '40	Mar. 23, '40	April 24, '40	May 10, '40	Aug. 7, '40
15	Dietary foods	Label statements	M. P. Markel	Mar. 28, '40	April 29, '40	(Cancelled, *Federal Register*, April 18, '40)			
16	Canned tomatoes	Identity[5]	J. M. Fox and M. P. Markel	Mar. 30, '40	May 2, '40	May 13, '40	May 21, '40	June 19, '40	Sept. 17, '40
17	Flours	Identity	W. G. Green, Jr.	April 12, '40	May 13, '40	(Cancelled, *Federal Register*, April 18, '40.)			
18	Canned asparagus	Identity[6]	M. P. Markel	May 3, '40	June 3, '40	June 14, '40	June 18, '40	June 28, '40	Sept. 26, '40
19	Canned cherries	Identity[7]	M. P. Markel	May 7, '40	June 5, '40	June 11, '40	June 18, '40	June 28, '40	Sept. 26, '40
20	Canned cherries	Quality[7]	M. P. Markel	May 7, '40	June 5, '40	June 11, '40	June 18, '40	June 28, '40	Sept. 26, '40
21-A	Flour	Identity	A. W. Willcox	Aug. 3, '40	Sept. 9, '40[1]	.....	.....	.....	.....
B	Durum flour	Identity	A. W. Willcox	Aug. 3, '40	Sept. 9, '40	.....	.....	.....	.....
C	Whole-wheat flour	Identity	A. W. Willcox	Aug. 3, '40	Sept. 9, '40	.....	.....	.....	.....
D	Cracked wheat	Identity	A. W. Willcox	Aug. 3, '40	Sept. 9, '40	.....	.....	.....	.....
E	Crushed wheat	Identity	A. W. Willcox	Aug. 3, '40	Sept. 9, '40	.....	.....	.....	.....
F	Whole durum wheat flour	Identity	A. W. Willcox	Aug. 3, '40	Sept. 9, '40	.....	.....	.....	.....
G	Self-rising flour	Identity	A. W. Willcox	Aug. 3, '40	Sept. 9, '40	.....	.....	.....	.....
H	Phosphated flour	Identity	A. W. Willcox	Aug. 3, '40	Sept. 9, '40	.....	.....	.....	.....
I	Farina	Identity	A. W. Willcox	Aug. 3, '40	Sept. 9, '40	.....	.....	.....	.....
J	Semolina	Identity	A. W. Willcox	Aug. 3, '40	Sept. 9, '40	.....	.....	.....	.....
22	Tomato catsup	Identity[8]	W. G. Green, Jr.	Aug. 10, '40	Sept. 11, '40	.....	.....	.....	.....
23	Canned fruits	Identity[9]	M. F. Markel	Aug. 17, '40	Sept. 16, '40	.....	.....	.....	.....

* Docket 1 pertains to tomato products, 2 to canned tomatoes, 3 to eggs and egg products, 4 and 9 to coal-tar colors and 5 to canned peaches, apricots, pears and cherries. See FOOD INDUSTRIES, October, 1939, page 569; January, 1940, page 70; and February, 1940, page 73, for data on these standards.

[1] Time extended from earlier date previously announced.

[2] Amending order of Docket 4.

[3] Standard of identity only, standards of quality and fill of container published in *Federal Register*, Nov. 25, '39.

[4] Typographical errors corrected in *Federal Register* on March 7.

[5] Amendment to order published in *Federal Register*, July 18, 1939 (Docket No. 2).

[6] Amendment to order published in *Federal Register*, February 28, 1940 (Docket No. 8).

[7] Amendment to order published in *Federal Register*, January 9, 1940 (Docket No. 5-IV).

[8] Amendment to order published in *Federal Register*, July 29, 1939 (Docket No. 1-C).

[9] Amendment to orders published in *Federal Register*, December 22, 1939, and January 9, 1940 (All parts of Docket No. 5).

Doubles Tolerances For Spray Residues

The permissible quantities of lead and arsenic on apples and pears shipped under the jurisdiction of the federal food law were doubled by an official advisory opinion released August 12 by Administrator Paul V. McNutt. From now on apples and pears may carry up to 0.05 grain of lead per pound and 0.025 grain of arsenic (As_2O_3) per pound.

These increased allowances apply only to these two specific fruits. They are not general in application. Nor have any changes been authorized in the tolerance for fluorine, which remains at 0.02 grain of F1 per pound for these fruits and for other commodities.

This decision to ease the restrictions is based on a report made by the Public Health Service to Security Administrator McNutt about July 1, this report being based on three years of research.

Under Section 406(a) of the law there will later be fixed, probably within a year, enforceable legal limits for all three of the common spray residues: lead, arsenic and fluorine. Then any violation will subject food to seizure and shippers to penalties without question. At present the advisory opinion does not have that rigorous meaning. Seizures and prosecutions will be made, but the actual hazard involved will have to be demonstrated in court for convictions. Nevertheless, full cooperation of the industry with this present informal advisory opinion is hoped for, and expected.

Industry spokesmen have welcomed the increased tolerance. However, they do regret that the limits were not set just a little higher, permitting wiping of apples instead of washing. Any such argument is not persuasive under the law, making necessary the fixing by FSA of a higher tolerance, it is explained informally in Washington.

Foods Source of Disease

"Foods were a more prolific source of disease outbreaks in 1938 than were milk or water supplies," according to a report, "Disease Outbreaks Resulting from Faulty Environmental Sanitation," by the U.S. Public Health Service. That report was issued on August 9.

The food-borne disease most frequently involved during 1938 was gastroenteritis, with 23 reported outbreaks and 1,015 cases. The diseases next most frequently involved were "food poisoning" and typhoid fever, with 19 outbreaks, 817 cases and 3 deaths; and 16 outbreaks, 251 cases and 16 deaths, respectively.

Sweet milk supplies were responsible for 38 of the 42 milk-borne outbreaks, one was traced to buttermilk, two to ice cream and one to cheese. In only one of the 38 outbreaks traced to sweet milk was any attempt made to pasteurize the milk. In this case the pasteurizer was reported broken down.

ONE TON per HOUR on 2,000 feet of GAS!

Bakers using the new Greer Automatic Band Oven figure on a ton of production per hour on 2,000 cubic feet of artificial gas. Yes, sir, a pound of any kind of cookies or crackers you want to bake for a foot of gas.

The efficient, new band-oven design is part of the story . . . the other part is that it's fired by Kemp Ribbon Flame Burners on 100 percent premixed gas and air from the famous Kemp Industrial Carburetor. This means complete combustion, absolute temperature control, uniform cross-oven heat distribution.

The Greer Automatic Band Oven is just one more application in which Kemp guarantees to save you money . . . or NO SALE! Whatever your heat-treating problem, it will pay to write . . . **The C. M. Kemp Manufacturing Company at 405 East Oliver Street, Baltimore, Maryland.**

KEMP of BALTIMORE

For SELLING *advantages* ..*as well as* LOWER COSTS

Introduced but a short time ago, hundreds of our FA machines are now in service all over the country . . . The reason is that the extremely versatile FA model not only lowers costs, but affords wide scope in carrying out new merchandising ideas with the package.

The machine is easily and quickly adjusted for a wide range of package sizes. This means that you can add new items or change your package size or proportions at will. The FA can be equipped to use any type of wrapping material—and in addition to wrapping ordinary cartons, the FA handles extension-edge boxes, open boats, turned-up-side trays, etc.

Manufacturers find this versatility a valuable sales help not only for introducing new products, but also on special occasions. For example, when two standard products are combined in one wrapping at a bargain price; or when regular packages are dressed up in special wrappers for the holiday trade.

The FA is but one of our 80 models of wrapping machines covering virtually every wrapping requirement in modern industry.

Get all the facts about the FA. Consult our nearest office.

Write for Literature

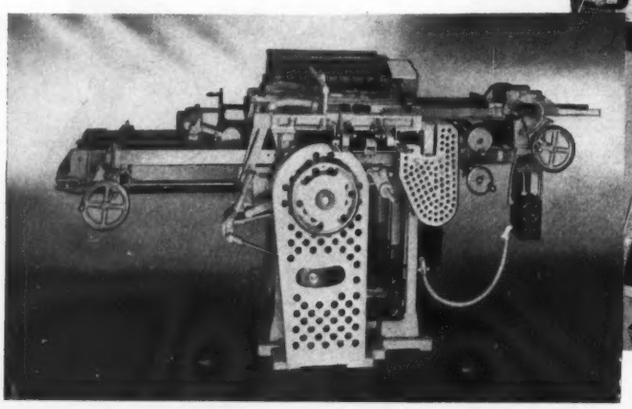
PACKAGE MACHINERY COMPANY
Springfield, Mass.

NEW YORK CHICAGO CLEVELAND LOS ANGELES TORONTO

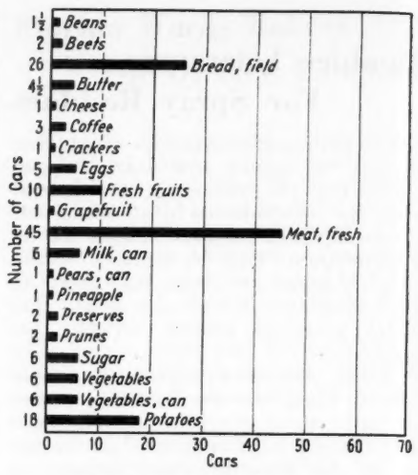
Mexico, D.F: Agencia Comercial Anahuac, Apartado 2303
Buenos Aires, Argentina: David H. Orton, Maipu 231
Peterborough, England: Baker Perkins, Ltd.
Melbourne, Australia: Baker Perkins, Pty., Ltd.

PAYS for itself in SAVINGS

Of simple design, the FA is reasonably priced, and quickly pays back its cost in savings. Fitted with Electric Eye, the machine handles printed material in roll form, saving up to 20% on the cost of material in cut-to-size sheets. Its speed and ease of operation lower labor costs.



PACKAGE MACHINERY COMPANY
Over a Quarter Billion Packages per day are wrapped on our Machines



WHAT THE ARMY EATS

During its maneuvers in the Sabine area (Texas-Louisiana) from Aug. 4 to 24, the Third Army traveled on a full stomach. This chart shows the number of carloads of the principal food items required during the maneuvers to feed this body of 70,000 men.

Surplus Problem Grows

Disposal of surpluses has grown gradually until it has become a major feature of the agricultural program. A total of $240,000,000 is being expended this year for the stamp plan, school lunches, mattresses and other forms of surplus disposal. The soil conservation appropriation is $500,000,000.

It is admitted at the Department of Agriculture that acreage control cannot go further. The proportion of crops that cannot be sold must be given away. The amount of farm stuffs that can be sold increases rapidly as industrial payrolls grow, but the tendency of relief expenditures is to grow despite improved employment. Expansion of the stamp plan already indicates that additional funds for surplus disposal will have to be voted.

Headquarters for Ideas Will Be Established

Headquarters for "ideas"—good ones, bad ones, off-center ones—will be established shortly by the National Inventors Council, appointed by Secretary of Commerce Hopkins to act as a clearing house for suggested inventions to aid in national defense. The council, headed by Charles Kettering of General Motors Research, expects to handle 100,000 suggestions a year. A full-time technical staff of probably 50 will be hired to classify and study all offers from Uncle Sam's citizens to their government. Nothing requires that inventions deal with munitions, either; any new plan for doing something differently or better will be accepted.

The council is a natural outgrowth of the growing spirit in Washington to

give the man with a seemingly "crackpot" scheme a chance to prove its value. In the modern "blitz" warfare, ideas laughed at yesterday have become potent weapons today.

In addition to lending a sympathetic ear to inventors, the council will accept specific problems from the defense commission and service forces and assign these to skilled laboratory and research men considered best able to find a solution.

Dovetailing into all this is the emergency legislation put onto the statute books in July permitting the Commissioner of Patents to order inventions kept secret by delaying issuance of a patent if he considers secrecy in the interests of national defense. Penalty for disclosure of any impounded invention would be forfeiture of all patent rights. The law stands for two years unless extended.

Seasonal exemption from the hours provisions of the Fair Labor Standards Act of the movement to and receiving into storage of rough Southern rice was made on Aug. 5 by Administrator Col. Philip B. Fleming. It had been shown that more than half of all Southern rice is moved to storage during a harvesting season of ten weeks.

Official grain standards for soybeans have been established by the Agricultural Marketing Service. These become effective Nov. 20 and were published in the *Federal Register* Aug. 20.

BACE May Work on Defense

The Bureau of Agricultural Chemistry and Engineering may be drafted into the defense program, halting much of its normal work to try its hand at spot problems. A comprehensive report of what the bureau could do in the way of research with a defense angle has been prepared for Secretary Wallace and the defense commission.

The report is strictly confidential and was developed more with a view to long-term possibilities than any immediate need. It's a sure bet, however, that if the bureau's services are called upon, projects such as dehydration and containers will be the first to be tackled.

The bureau's Los Angeles laboratory has been looking into dehydration for a long time as a routine assignment, and this work could easily be expanded.

SCHEDULE OF EVENTS

SEPTEMBER

5- 6—American Fisheries Society, Royal York Hotel, Toronto.
9–13—American Chemical Society, semi-annual meeting, Detroit.
12–14—Associated Coffee Industries of America, White Sulphur Springs, W. Va.
22–25—Super Market Institute, Kansas City.
25 (approximate)—National Pickle Packers Association, fall meeting, Palmer House, Chicago.

OCTOBER

2- 4—American Oil Chemists Society, Stevens Hotel, Chicago.
7–11—National Safety Congress, Stevens Hotel, Chicago.
12–19—National Dairy Association, Harrisburg, Pa.
13–16—American Bakers Association, Hotel Sherman, Chicago.
13–20—National Wine Week.
19–24—Master Brewers Association, Municipal Auditorium, St. Louis.
20–24—American Dietetic Association, Pennsylvania Hotel, New York.
21–23—International Association of Milk Dealers, Haddon Hall, Atlantic City, N. J.
21–26—Dairy Industries Exposition, Atlantic City, N. J.
22–23—Association of Food and Drug Officials of the United States, New Orleans.
24–26—International Association of Ice Cream Manufacturers, Ambassador Hotel, Atlantic City, N. J.

CAPITAL VIEWS

MONOPOLY vs. DEFENSE—The Antitrust Division has long planned another anti-monopoly attack on the petroleum industry. Just as they were ready to bring suit, the Defense Commission folks suggested that it was hardly fair to swing a club at an industry with one arm while holding the other extended requesting favors in the defense program. Thus there has been a temporary delay in the effort to break up great integrated petroleum enterprises.

Thus far no food companies have been subject to similar question or attack. They may well be in the near future if Assistant Attorney General Thurman Arnold has his way. He is very anxious to go into the food problem, promises a thorough investigation. It does not appear that the preparedness feature of the food industry will afford the same protection as has been suggested for the petroleum enterprises. The whole situation will bear watching, and a bit of worrying.

TRUCK RULES LATER—The anticipated regulations of privately owned motor vehicles used in interstate transport was postponed from Aug. 1 to Oct. 1. At this later date the ICC regulations regarding drivers, equipment, inspections and reports will be applicable, even though the truck does not cross a state line, but when the goods are handled interstate by some other cooperating carrier such as a railroad.

FOOD PLANT LEARNERS—Executives wanting to employ learners at wage rates lower than fixed by the Fair Labor Standards Act now have a simpler set of regulations to guide their dealings with Uncle Sam. Prima facie showing of the need will result promptly in permits for learners, but subsequent cancellation and disciplinary action will occur if the case has not been justified under the law. This is to stop, and punish, those who may try unfairly to take advantage of their desire for cheap labor. There are plenty of teeth to bite such folks who overreach their rights.

SOLDIER REEMPLOYMENT—Those who drop workers from payrolls when the boys go to camp will need to take account of new rules still pending in Congress. Whether such workers go as draftees, as reserve officers or for the National Guard, they are going to be protected in their right to return to their job if Congress can work out such a plan in workable form. Personnel executives must at this stage be very careful about discharges to be sure that they protect against the subsequent claims by workers when they return.

MORE TAXES—Political controversy is long holding up the excess-profits tax bill. Most dangerous for the Congressmen is the need to go on record with reference to the rapid amortization plan desired by the Army for new defense construction. However that feature may be worked out, it is certain that earnings greater than those typical of 1935 to 1939 will be heavily cut by special anti-profiteering levies. The growing business is going to be most hit by this sort of tax.

WATERWAY REGULATION—It is now evident that Congress has stayed in Washington long enough to work out a compromise on the plan to put all water traffic under ICC regulation. No impartial observer denies that this means a raising of freight rates on water-borne traffic. The bill is admittedly an umbrella over inefficient railroad systems. And for political reasons it provides for protection of even wholly unnecessary employees when consolidations and other modernization programs are developed. Industry will pay the increased bill.

FUMIGATION RULES—Import of certain fruits and vegetables, especially from Hawaii, is now permissible if adequate methyl bromide fumigation is performed at the port of entry. Comparable fumigation of manufactured foods gives insect control, but care must be taken to avoid the residues of the toxic fumigant in foods which may absorb that chemical. This problem is more serious with certain manufactured goods than with fresh fruits and vegetables.

FOREIGN ENTANGLEMENTS—American firms enjoying patent exchange agreements with foreign countries are being subjected to scrutiny by the antitrust division of the Department of Justice. It is alleged that certain foreign enterprises through this patent pooling unduly restrain interstate and foreign commerce, and thus are subject to prosecution. The form of agreement involved appears to be quite significant, as highly technical legal proceedings are necessary for court action. Operating executives with foreign patent agreements should have just as good legal advice regarding them as with respect to domestic patent arrangements which are equally subject to antitrust suspicion.

HOLD THOSE STANDARDS—Regardless of any claims about labor shortage, the official Administration policy is to insist on absolute compliance with wage-hour rules. This does not interfere with defense planning, the President argues, because industry can pay time and one-half beyond 40 hours (after Oct. 24) and work the men longer than normal if really necessary. But there is no evidence that the resulting increase in costs of goods are justified in the minds of the price watchers who still dominate most of New Deal thinking. The appearance of a profit is a cause for suspicion with these folks.

Saves $9000 per Year by FILTRATION

Imagine a weekly average of 4,200 lbs. of candy scrap going to waste and then discovering that its valuable sugar syrup content can be profitably recovered by filtration. It happened with one large candy manufacturer.

By installing a Shriver Plate and Frame Filter and using a good filter aid they are now recovering all the sugar at an overall cost of less than ½¢ per lb. at a net saving of about $175 per week.

This is only one of many Shriver case histories on production savings or improvement in quality through filtration, whether it is on syrups, extracts, cider, vinegar, wine, whey, vitamins, oils or a hundred other food products.

Learn why and how a Shriver Filter can add many dollars to your profits by improving the saleability of your products, cutting down production cost or cutting out waste.

●

LET OUR LABORATORY

determine what better filtration can do for your product; send us a sample; we'll investigate the filtration rate, capacity and method to meet your requirements and give you our unbiased recommendation. No obligation, of course.

T. SHRIVER & COMPANY

860 Hamilton St. Harrison, N. J.

***Western Agent*—The Merrill Co.**
343 Sansome St. San Francisco, Calif.

FOR BETTER QUALITY
Shriver FILTERS
RECOVER SOLIDS · CLARIFY · DECOLORIZE

Two Companies Enter Stipulations of FTC

Two food companies entered into stipulations of the Federal Trade Commission last month. Curtiss Candy Co., Chicago, will cease advertising that "Baby Ruth" candy will avoid fat. And it further agrees to cease representing that the candy will avoid fatigue; sustains body activity; reinforces body resistance to avoid ill health; or will snap one out of spring fever, unless it is clearly stated that it is intended to help overcome fatigue and temporarily increase energy when eaten between meals. The company also agreed to discontinue representing that it is necessary to eat dextrose to secure the energy building and sustaining foods, or that people who need energy need dextrose or "Baby Ruth" bars.

Superior Brands, Inc., New York, agreed to cease representing that its flavoring concentrate, "Ry-Taste," is the only 100 percent pure rye culture or that it actually is 100 percent pure; is a natural rye product devoid of any artificial or sour acids or adulterations; contains in concentrated form all of the aromatic flavors, color or serums of the rye berry; may be considered as part of the rye flour for labeling purposes, or that no additional labeling would be necessary on brands flavored with "Ry-Taste" concentrate.

To Publicize Meat Values

Plans for a $2,000,000 nationwide campaign to advertise the values of meat have been revealed by Institute of American Meat Packers. The purpose of the campaign is to inform the public as to the scientific discoveries which have shown that there are new values in meats.

"The use of meat in America has not kept up with population increases, and together with the shutting off of markets by the present war, the meat industry must endeavor to increase consumption." This is the picture as seen by Wesley Hardenberg, president of IAMP.

Rails Battle Boats With Food Rate Cut

The battle between rail and water carriers over rates on canned citrus fruits and fruit juices from Florida to the Pacific coast flared again in August. The railroads revived the squabble by filing proposed new all-rail rates from Tampa to transcontinental destinations and intermediate points with the Interstate Commerce Commission.

The new all-rail rates would be 96 cents per 100 lb., with minimum 60,000-lb. shipments. Existing joint water-rail rates on canned goods from Tampa are 88 cents, minimum 80,000 lb.; and 99 cents, minimum 40,000 lb. All-rail rates have been $1.16, minimum 40,000 lb.; and $1.05, minimum 60,000 lb.

Filing of the new all-rail tariffs brought immediate petitions from the New Orleans Joint Traffic Bureau, J. T. Gibbons, Inc., New Orleans, and Pan-Atlantic Steamship Corp. asking suspension and a full investigation. The petitions argued that one steamship line between Florida and New Orleans already has abandoned service because of rail competition and that the proposed new all-rail tariffs might cause abandonment of the one line still operating over this route.

Construction News

	Pending (thousands)	Awarded August (thousands)	Total Awarded 1940 (thousands)
Bakery	$80	$40	$1,837
Beverages	901	651	5,692
Canning and Preserving	150	.....	163
Cold Storage Plants	80	.....	585
Confectionery	.....	40	570
Grain Mill Products	355	.....	1,315
Ice Manufactured	.....	.....	231
Meats and Meat Products	80	45	1,415
Milk Products	205	50	1,169
Miscellaneous	255	410	4,326
	$2,106	$1,236	$17,303

More Fats and Oils Produced This Year

A record-breaking pig crop in 1939 was largely responsible for an 11 percent increase in the production of fats and oils in the first six months of 1940, as compared to the corresponding period of last year. The output of 4.1 billion pounds (from domestic and imported materials) compares to the record production for the complete year of 1939 of 8.4 billion pounds.

Since the six-months figures do not include farm production of butter and lard, estimated annually, and since oilseed crushing is normally greater in the last six months of the year, indications are that the total 1940 fat and oil production will set a new record. Increases in soybean and flaxseed acreages and the return to the pre-drought level of lard production will probably more than balance any decreases in other fats and oils imports and production. Continued low prices for fats and oils are expected.

Lard production, January through June, was up 32 percent from 673,000,000 lb. in 1939 to 889,000,000 lb. in 1940. Inedible tallow and grease output increased 34 percent from 545,000,000 lb. to 731,000,000 lb. Production of soybean oil was up from 226,000,000 lb. to 277,000,000 lb., an increase of 23 percent. Coconut oil output increased from 142,000,000 lb. to 186,000,000 lb. and corn oil from 69,000,000 lb. to 82,000,000 lb. In contrast, cottonseed oil production was down 10 percent from 577,000,000 lb. to 522,000,000 lb., and peanut oil output fell 65 percent from 60,000,000 lb. to 21,000,000 lb.

Lard consumption in the first six

months of 1940 was only 626,000,000 lb., in consequence of which lard stocks reached a record high on July 1. The 310,000,000 lb. of lard in stock then included 102,000,000 lb. purchased by the Surplus Marketing Administration (successor to FSCC). Delivery instructions in the latter part of July moved about 14,000,000 lb. of this lard out of stock.

Production and consumption of manufactured shortenings, reacting to the large supply of lard and the resulting low prices of all competing food fats, declined 14 percent to 561,000,000 lb. and 563,000,000 lb. for the six-month period, respectively.

Margarine production changed very little in total quantity, but the shift in oils used in its manufacture was noticeable, with soybean oil increases replacing about half of the coconut oil used during the corresponding period last year. The principal figures for January-June, 1940, consumption in margarine manufacture were: Cottonseed oil, 53,000,000 lb., up 4 percent; soybean oil, 42,000,000 lb., up 40 percent; coconut oil, 14,000,000 lb., down 46 percent.

Carbonated Beverages Use More Sugar

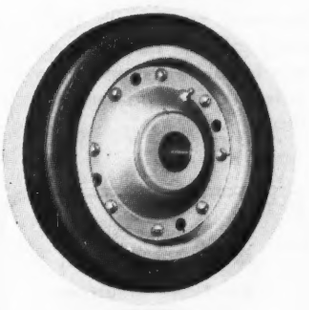
Recent estimates of sugar consumption by certain official agencies have apparently indicated a much smaller use of sugar in the carbonated beverage industry than is actually the fact. One such estimate indicates that only 150,000 tons of sugar a year are consumed in the manufacture of non-alcoholic beverages. In contrast, estimates by the American Bottlers of Carbonated Beverages disclose that "the industry consumes in excess of a quarter of a million tons of sugar annually." In fact, calculation from typical beverage strengths indicate that, in 1939, probably more than 300,000 tons of sugar were used by the industry.

Carbonated beverage manufacture requires sugar properly freed from bacteria, molds and yeasts, to protect the product from rapid spoilage, as most such beverages are not sterilized or pasteurized after the mixtures are made up for bottling. This presents important technical problems to the sugar refiner.

Incidentally, the carbonated beverage industry estimates that its annual sales during recent years have been around $450,000,000, equivalent to about 15 billion half-pint containers.

Commodities Mark Time

Spellbound in contemplation of the possible outcome of war over Britain, traders in commodities showed little positive action during the four weeks from July 20 to Aug. 17, 1940. During this period, the *New York Journal of Commerce's* weekly commodity price index showed a net change of only 0.1, from 77.9 to 77.8. The same publication's index for grains fell from 60.2


DARNELL
CASTERS & WHEELS

Save Money

- Reduce Floor Wear to a minimum.
- Increase efficiency of employees.
- Eliminate wracking of equipment.
- Save time, speed up production.

SEND FOR THIS BOOK IT'S FREE!

Ask for New 192 Page DARNELL MANUAL

DARNELL CORPORATION, LTD.
BOX 4027, STA. B, LONG BEACH, CALIF.
36 N. CLINTON, CHICAGO — 24 E. 22nd, NEW YORK
DARNELL CORP. OF CANADA, LTD., TORONTO, ONT., CAN.

More Plants Are Discovering the Better, Faster Oakite Way of Floor Washing

A FOOD PLANT: In this spaghetti packing plant, some tomato sauce unavoidably drops on the floor. To quickly loosen and remove it, an Oakite solution is applied with the Oakite Solution-Lifting Steam Gun. Cleaning is surprisingly easy, fast, thorough.

A CONFECTIONERY PLANT: Floors and passageways of one chocolate bar manufacturing plant soon get coated with a tacky mixture of chocolate and ground peanuts that hand trucks compress into a thick, hard covering. A hot solution of recommended Oakite material is allowed to soak. Following light brushing and hose-off, concrete surfaces show up absolutely clean.

A MEAT PACKING PLANT: Washing sausage-room floors with their former material never gave entirely satisfactory job. But now, due to emulsifying and fast grease-dissolving action of Oakite Composition No. 37, all deposits are removed with less effort, and at lower cost. After rinsing, floors are clean, film-free, non-slippery.

OVER 53 DIFFERENT OAKITE MATERIALS AVAILABLE

For meat packing plants, canning, confectionery, dairy, bottling, sea food and others, there is an Oakite cleaning material and method that will effectively, economically help you safeguard product quality, purity and flavor . . . step-up cleaning efficiency. Write today for data and fact-filled booklets on your business.

OAKITE Certified CLEANING

Complete Nation-Wide Service For These Industries

•

CANNING
BAKING
MEAT PACKING
SEA FOOD
BOTTLING
DAIRY
ICE CREAM
CEREAL PRODUCTS
BREWING

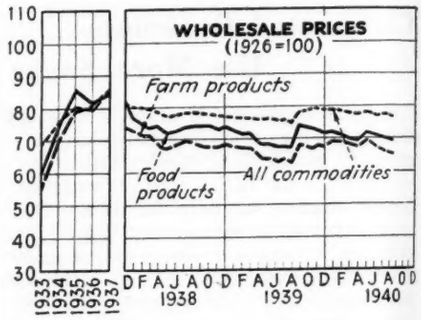
Manufactured only by

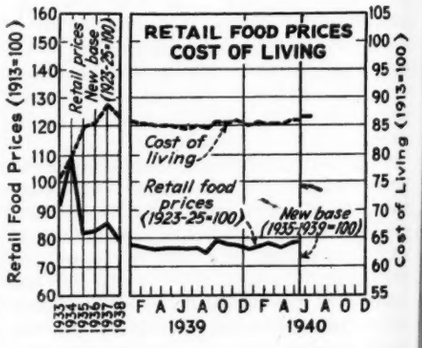
OAKITE PRODUCTS, INC., 26G THAMES ST., NEW YORK, N. Y.

Representatives in All Principal Cities of the United States and Canada

to 58.3 during that period, while in contrast its index for foods rose from 64.9 to 66.2, the 1927-1929 average being 100 or normal. This situation arises from the fact that many food raw commodities are in surplus supply in exporting countries. Until the battle for England is decided one way or another, uncertainty will continue as to the size of the effective export market for these export surpluses. Meanwhile, prices tend to fall off, but are relatively steady.

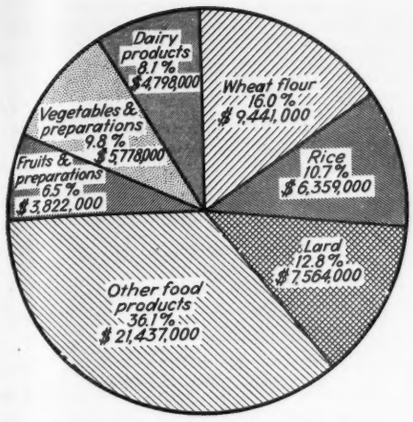
Prices for individual food commodities show varying trends. Wheat, No. 2 dark winter, at 66½c. on July 15, stood at 67¼c. on August 15. Flour fell 10c. a barrel to $4.30, during the same month. Corn, No. 3 yellow, at 64½c. on July 15, rose to 65¾c. by August 15. Beef increased from 16½c. to 18c. during the month, lamb upped from 17c. to 21c., while pork loins remained steady at 18c. Lard showed a large drop, from $6.25 to $5.25. Eggs were steady, while butter increased ¾c. Sugar, coffee and cocoa all showed some decrease in price. Canned foods also showed some small price declines.





Data for the Charts

In preparing the curves shown on this and the succeeding page of FOOD INDUSTRIES, data were obtained from the following sources: Prices received by farmers, U. S. Department of Agriculture; employment, payrolls, wholesale and retail prices, U. S. Department of Labor; cost of living, National Industrial Conference Board; commodity price index, *N. Y. Journal of Commerce;* business activity index, *Business Week;* data for Latin American trade are from the U. S. Department of Commerce.


Dairy products 8.1% $4,798,000
Wheat flour 16.0% $9,441,000
Vegetables & preparations 9.8% $5,778,000
Fruits & preparations 6.5% $3,822,000
Rice 10.7% $6,359,000
Lard 12.8% $7,564,000
Other food products 36.1% $21,437,000

The Latin American market for United States food products—1939

INDICATORS

FEDERALLY INSPECTED slaughter of cattle, hogs and sheep in July, 1940, exceeded the figures of the same month in 1939 by considerable amounts.

EDIBLE GELATINE produced in the second quarter of 1940 was 6,970,685 lb., compared to 6,322,897 lb. in the second quarter of 1939, according to the U. S. Department of Commerce.

HOG SUPPLIES for Federally inspected slaughter in the year beginning Oct. 1, 1940, are expected to be 10 percent below the supplies of the current year.

CANNED FISHERY PRODUCTS and by-products produced in the United States and Alaska in 1939 were valued at $130,423,000, an increase of 14 percent over 1938.

WHEAT CARRYOVER, as of July 1, is officially estimated to have been 284,088,000 bu., compared to a carryover of 254,000,000 bu. a year before.

CONFECTIONERY and competitive chocolate products sales in June, 1940, as reported to the U. S. Department of Commerce were $12,657,000 compared to $12,459,000 for the month of June, 1939, for an identical group of manufacturers.

COTTONSEED OIL CONSUMPTION in July totaled 258,730 bbl., compared to 246,655 bbl. in June, and to 242,837 bbl. in July, 1939.

BUTTER, creamery, produced in June, 1940, was at a new record level of 203,800,000 lb., 2 percent over June, 1939, production and comparing to the previous record of 202,528,000 lb., made in June, 1938.

CHEESE, American, produced in June, 1940, was 74,090,000 lb., 6 percent over the production recorded in June of last year.

EVAPORATED MILK PRODUCTION in June, 1940, was 294,203,000 lb., the largest June production on record and 10 percent over production in June, 1939.

CONDENSED MILK PRODUCTION in June, 1940, was 6,157,000 lb., the greatest for any month since August, 1934, and more than double the output of June, 1939.

EGG OUTPUT in July, 1940, was 9,369,000 cases, 3 percent over July, 1939, and the largest July production since 1931.

MILK PRODUCTION on July 1, 1940, was 2 percent greater than on July 1, 1939, the previous peak for the date.

OLEOMARGARINE SALES in June, 1940, as indicated by sales of internal revenue tax stamps, totaled 16,812,066 lb., compared to 17,919,202 lb. for June in the preceding year.

SUGAR DELIVERIES for consumption, first seven months of 1940, totaled 3,761,957 short tons, raw value, up 218,114 tons over deliveries in the corresponding period of last year.

TEA IMPORTS, year ending June 30, 1940, at 102,460,201 lb. were the highest on record.

WINE CONSUMPTION (California wines), first four months of 1940, at 21,741,058 gal. was 16 percent over the figure of the corresponding 1939 period. Sales in May were also up 11½ percent over May of last year.

COFFEE IMPORTS in the United States for the crop year ending July 31, 1940, at 15,482,830 bags were at an all-time high, 4 percent over 1939 imports.

FROZEN FRUITS in storage on Aug. 1, 1940, totaled 150,280,000 lb. compared to 132,136,000 lb. on Aug. 1, 1939, and to a 1935-1939 average of 113,845,000 lb. for the date.

FROZEN VEGETABLES in storage, Aug. 1, 1940, totaled 71,774,000 lb. compared to 63,286,000 lb. a year before.

BUTTER, creamery, in storage on Aug. 1, 1940, was 124,244,000 lb., compared to 165,183,000 lb. on Aug. 1, 1939, and to a 1935-1939 average of 143,038,000 lb. for the date.

CHEESE, all kinds, in storage on Aug. 1, 1940, amounted to 138,030,000 lb., compared to 117,598,000 lb. a year earlier and to a 1935-1939 average of 112,453,000 lb. for the date.

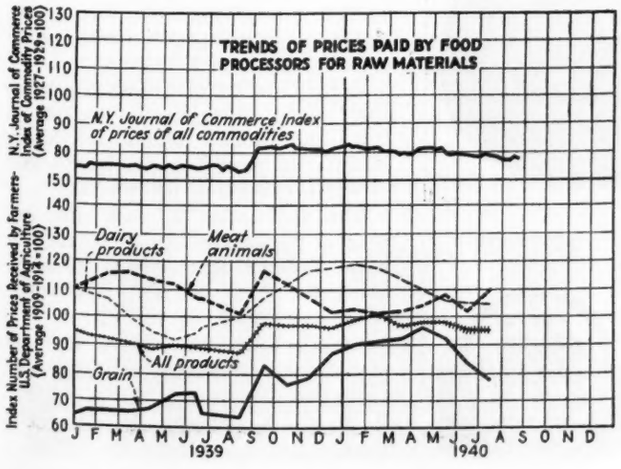
EGGS, case equivalent, in storage on Aug. 1 of this year were 12,200,000 cases. The figure of Aug. 1, 1939, was 11,149,000 cases and the 1935-1939 average was 11,363,000 cases for the date.

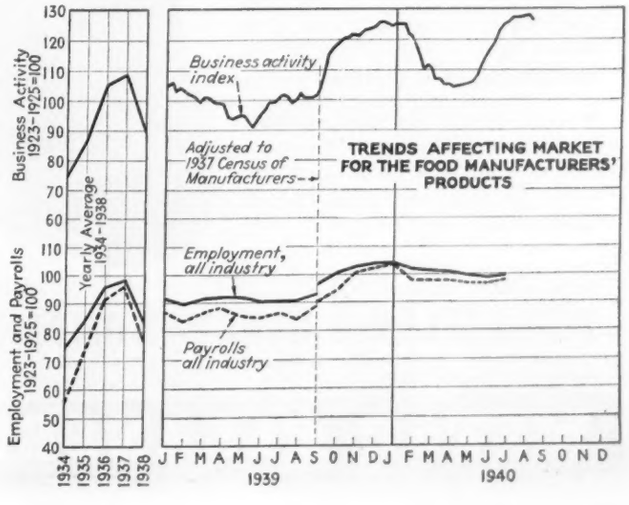
POULTRY, all kinds, in frozen storage on Aug. 1, 1940, amounted to 82,361,000 lb., compared to 64,918,000 lb. a year before and to a 1935-1939 average of 55,616,000 lb. for the date.

MEAT, all kinds, in cure and frozen storage on Aug. 1, 1940, totaled 671,369,000 lb., compared to 559,128,000 lb. on Aug. 1, 1939, and to a 1935-1939 average of 526,957,000 lb. for the date.

LARD in storage Aug. 1, 1940, was 303,068,000 lb. A year before the total was 139,815,000 lb., and the average for the date was 121,182,000 lb. in 1935-1939.

WEEKLY WHOLESALE FOOD PRICE INDEX of Dun & Bradstreet stood at $2.24 on Aug. 13, compared to $2.23 a month before and $2.13 a year previous.





THE READERS SPEAK

Continuous Jelly Process

To the Editor of Food Industries:

When you kindly published a description of the "Continuous Jelly Process" in Food Industries, April, 1939, it was your and the author's aim to focus the attention of the manufacturers in the food industry on the possibilities of simplifying their processes, decreasing manufacturing costs and improving the product.

Am pleased to note that Dr. Baker and Mr. Pheteplace were able to develop a continuous jelly process as described in your July, 1940, issue. When analyzing the processes, a distinction must be made between batch, semi-continuous and continuous process. It appears that Dr. Baker's process should be classified as "semi-continuous."

According to this process, evaporation is carried out under vacuum and the concentrated product stored until required. The same applies for sugar liquors. According to their flow sheet, the prepared liquids pass into feed tanks and from there they are mixed continuously and collected in another tank.

For a continuous process too many storage tanks are in use and I am inclined to think that a few very important factors for the manufacture of jelly have been overlooked. The cooking and mixing, coagulation and removal of albuminoids, and the addition of pectin and acid cannot be carried out in every instance as simply as the flow sheet indicates. While attention is directed to the fact that the rate of inversion might not be detrimental to the jelly, still the time factor for a uniform product is not applicable in this instance, as the jelly discharged from the storage tank will show continuous variation in the percentage of invert sugar.

In conclusion, I must state it is gratifying to know that food technologists realize more and more the importance of thinking along chemical engineering lines as emphasized by you at the Chicago meeting of the Institute of Food Technologists.—G. T. Reich, *Technical Director, Pennsylvania Sugar Co., Philadelphia, Pa.*

Horror

To the Editor of Food Industries:

In Food Industries, Vol. 12, No. 5, page 99, we read "Mushroom Poisoning" with a feeling of horror.

Amanita pantherina is listed there amongst edible genera. This species is invariably listed as deadly poisonous and has an unsavory record in both Europe and North America, as it has frequently been confused with the common edible mushroom, *Psalliota (Agaricus) campestris.* While not as deadly as the Death Angel, *Amanita phalloides,* it is capable of causing serious poisoning.

A "Guide to the Mushrooms of New York," by L. C. C. Krieger, "New York State Museum Handbook 11," has a very complete description and colored plates.

—K. A. Harrison, *Dominion Laboratory of Plant Pathology, Kentville, Nova Scotia.*

Reply on Horror

To the Editor of Food Industries:

In response to your correspondence with K. A. Harrison of the Canadian Department of Agriculture, I have reexamined the original article on "Mushroom Poisoning" carefully.

The edibility of *Amanita pantherina* is only implied, not directly stated, by Roizman and Sosin. That is, they begin with a discussion of poisonous mushrooms, in which they remark that *Amanita phalloides* is highly poisonous. They then proceed to a consideration of edible mushrooms and their reactions with test reagents. Next they take up the chemical tests for distinguishing the poisonous mushroom *Entoloma lividum Quel* from various mushrooms of the genera *Amanita* (including *pantherina*), *Russula, Lactarius* and *Boletus.*

Beyond stating that these genera include some edible species (which is true) the authors do not specifically identify the named species in this part of the discussion as being edible.

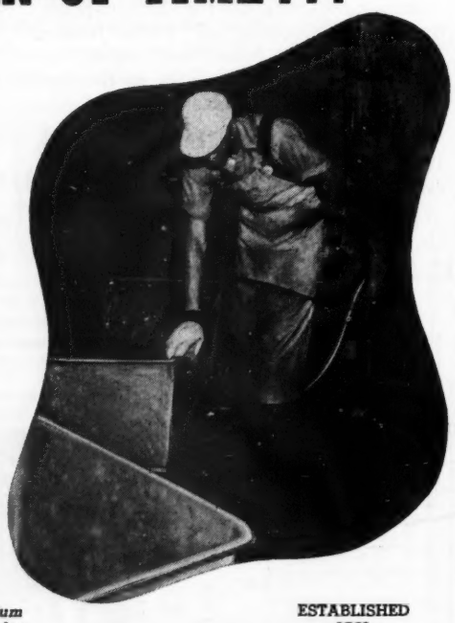
The implication is such that one reading the original article would presume *Amanita pantherina* to be in the edible list if he did not know better.

—Translator.

Inasmuch as the editors have no knowledge of the Russian tongue, the foregoing explanation from the translator is all that can be said.—The Editors.

WHEN IT'S CLEAN-UP TIME . . .

Action!



LONG cleaning time earns no profit and so more food plants are standardizing on Metso, fast dissolving cleaner. It lifts grime and grease in record time. You'll very soon discover the high wetting efficiency of Metso speedily cuts through the grease, and then a special ingredient holds on, until all of it is rinsed away.

Get a sample of the quick-action, free rinsing Metso to try out on one of your dirt removal problems. It's economical in use and price.

Metso Cleaners (Sodium Metasilicate & Sodium Sesquisilicate) originated and developed by

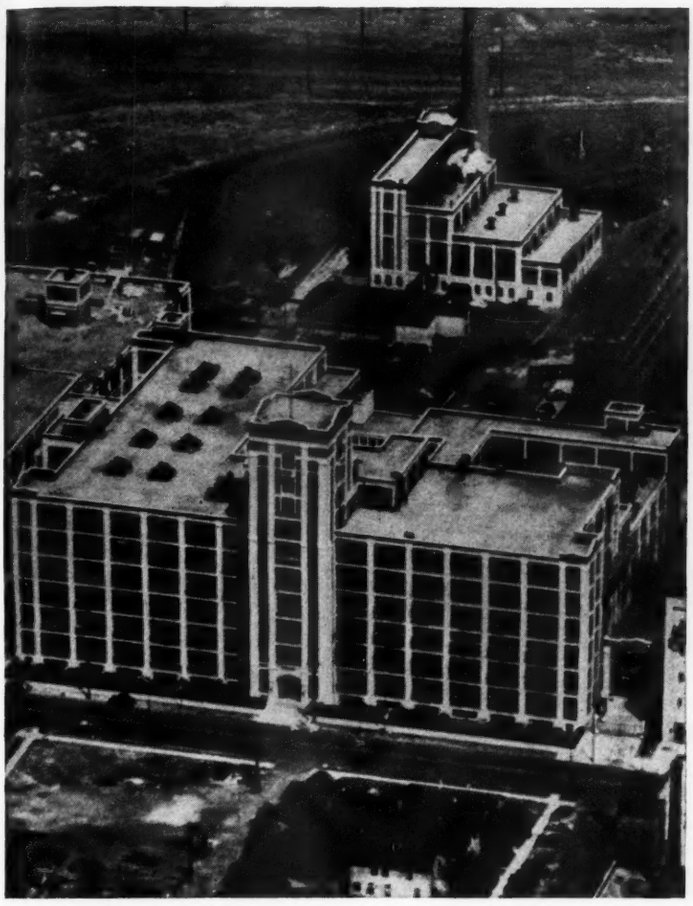
ESTABLISHED 1831

PHILADELPHIA QUARTZ COMPANY

General Offices: 125 S. Third St., Philadelphia. Chicago Sales Office: 205 W. Wacker Dr. Stocks in 60 cities. Sold in Canada by National Silicates Ltd., Toronto.

METSO CLEANERS

METSO



How-

A Branch Plant in Illinois Can Make Money for Food Packers and Food Manufacturers

Illinois is the leading industrial state in the heart of Agricultural America. Combined here are all the advantages to industry which accompany diversified industrial activity and the unlimited sources of unprocessed farm products which are available by reason of Illinois' strategic central location.

In Illinois, food packers and food manufacturers have the four factors of profitable operations—the raw materials, the facilities for packing, processing and manufacturing, central location with direct shipping service to all parts of the Nation and within overnight shipping radius of the huge Middle West Market, and unequalled distribution facilities. Add to these four prime requisites the other contributing advantages, such as large labor supply, to be gained from locating a branch plant in Illinois, and you have the whole picture.

Special Confidential Report to Executives

To obtain the complete story of what an Illinois location can mean to your business, write to the Illinois Development Council in Springfield for a specially prepared report on the manufacturing, sales and distribution opportunities in Illinois—a report containing detailed information on raw materials, labor, taxes, power, markets, natural resources, and transportation facilities as they apply to Food Packers and Food Manufacturers.

If you have some special requirements regarding which you desire information, please give full details so that a truly practical and informative report can be submitted to you. Your inquiry will, of course, be kept confidential. Write—

ILLINOIS DEVELOPMENT COUNCIL • STATE HOUSE • SPRINGFIELD, ILLINOIS

ILLINOIS FACTS

Illinois is third among all the States in farm income and produces more than 11% of the national output of processed, packed, and manufactured foods.

Of all the States, Illinois is the only one which ranks among the first ten in the production of all seven of the leading crops requiring processing. Illinois is first in production of soybeans and sweet corn; second in field corn; third in oats; fourth in winter wheat; ninth in barley; and tenth in rye. Illinois shares with only three other States the distinction of ranking among the first nine States in production of both apples and peaches. Illinois is one of the first eight States in production of feed and dairy cattle, milk production, and production of hogs, chickens and eggs.

Located in Illinois are the finest agricultural research laboratories in the world—the U. S. Department of Agriculture Research Laboratory at Peoria, the University of Illinois Agricultural Experiment Station, and several excellent privately owned research laboratories.

The largest food machinery manufacturing company, two of the largest can manufacturing companies, and large manufacturers of containers of glass and other materials are located in Illinois.

Abundant water supplies are available from eight great drainage basins in Illinois. Analyses showing flow of surface waters, underground supplies, and mineral content of water for any locality can be obtained on request.

ILLINOIS

THE STATE OF BALANCED ADVANTAGES

Men, Jobs & Companies

INDUSTRY

Baldwin (N.Y.) Canning Co., Inc., is building a new factory for the manufacture of spaghetti sauce.

Baum Packing Co., Danville, Ill., will spend about $100,000 for plant remodeling and for construction of a 3-story reinforced concrete cooler building.

Campbell Soup Co., Camden, N. J., will build a 5-story addition to its Chicago plant.

Canada Dry Ginger Ale, Inc., New York, will promote its beverage "Spur" throughout eleven states by means of a non-rigid airship trailing a 300-ft. banner by day and flashing "Neon-A-Gram" messages at night. The airship has been leased from Goodyear Tire & Rubber Co. The company will also extend its franchise for Spur to include bottlers in Long Island and the major parts of New York, New Jersey and Pennsylvania.

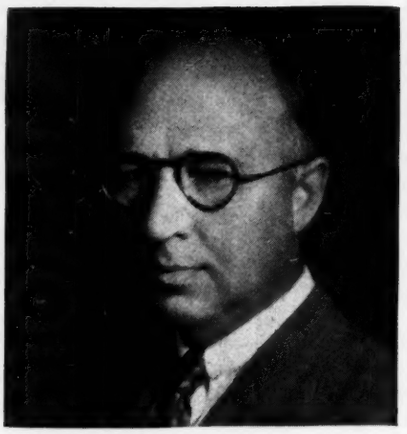
Joseph Chuckrow's Sons, Troy, N. Y., has sent 150 bbl. of dressed, fresh-killed roasters to Omaha (Neb.) Packing Co. by means of refrigerated truck for ultimate shipment to the West Coast. It is said to be the first westward movement of New York poultry.

DR. C. G. HARREL

Pillsbury Flour Mills Co., Minneapolis, has placed him in charge of the new research laboratory which it has set up to separate research completely from products control. Dr. Harrel has been head of the products control laboratory since 1932, and his successor there is R. C. Benson who first became associated with the laboratory in 1919. The new research laboratory will be housed in a specially designed, entirely modern building.

COL. B. F. CASTLE

Milk Industry Foundation, New York, has elected him president to succeed Frank F. Rennie, Jr., who becomes chairman of the board. Colonel Castle was formerly vice-president of Administrative and Research Corp. of New York. Mr. Rennie is president of Virginia Dairy Co., Richmond.



A. Q. PETERSEN

He has been advanced from vice-president to president of Wesson Oil & Snowdrift Co., Inc., New Orleans, and Southern Cotton Oil Co. He succeeds the late A. D. Geoghegan, who died Aug. 1. Forty of Mr. Geoghegan's 63 years were spent in the cotton and cottonseed products industry.

Cook Packing Co., Scottsbluff, Neb., has started construction of a $100,000 addition for lamb processing.

General Seafoods Corp., Boston, has purchased the assets and business of Gulf Fish & Shrimp Co., Inc., of New Orleans, and National Seafoods Co., Inc., of Galveston, Tex. The acquired companies will quick freeze and can shrimp, besides handling the fresh product. C. L. Daniel, managing owner of National Seafoods, will become general manager of the shrimp operation for General Seafoods. C. Allen Greiner, manager of Gulf Fish & Shrimp Co., will be production manager.

Hills Bros. Co., New York, has begun operation of a pepper packing plant at Woodbury, Ga., said to be one of the largest pepper canneries in the United States.

Kellogg Co., Battle Creek, has added two new folders to its vitamin series in recognition of the growing influence that vitamins are having on the consumer buying habits. One of the folders supplies a week's menu built around foods of high vitamin content. The other gives vitamin recipes such as for "rhubarb crisp", rich in vitamin C; and "Spinach Supreme," containing vitamins A, G and C.

John Morrell & Co., Ottumwa, Iowa, will build a 5-story brick and concrete packing house.

Old Fort Mills, Inc., is rebuilding its soybean processing plant at Marion, Ohio, at a cost of about $100,000.

Snider Packing Corp., Rochester, N. Y., is experimenting with the marketing of frozen peas, asparagus and spinach under its own "Snider" brand in the Chicago market. The company in the past has been packing such products for the Birds Eye Frosted Foods Corp., but this is its first adventure as a frozen foods marketer.

Sunrise Creamery Co. has completed a $250,000 plant at Cheyenne, Wyo.

PERSONNEL

J. M. Aycock is building a $30,000 meat packing plant, to be known as Mid-South Packing Co., at Tupelo, Miss., which will handle 300 to 400

NO OTHER ITS EQUAL

in POWER and GAS SAVINGS

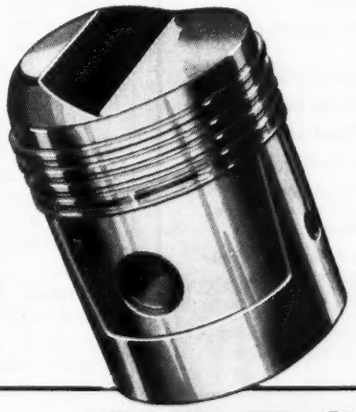
Remember this fact when you buy your next trucks: *Published data shows that GMCs lead all others in pulling power* in every engine size from ½-ton to 15-tons. This means *livelier* performance in traffic, *faster* hill climbing, *better time* on long runs . . . with less strain on truck and driver. And GMC's unmatched power is *all profit!* In fact, owners report gas savings of 15% to 40% over comparable trucks. Your GMC Dealer can quickly prove what a GMC can save for you, with the Mileage Meter. See him. See the GMC that's built for your kind of hauling. Check its gas economy. Then check the price—you'll find GMC prices right down with the very lowest. And the GMC line is the most complete in the industry.

Our own YMAC Time Payment Plan assures you of lowest available rates

Here's why

OWNERS SAVE 15% to 40% on GAS!

GMC's TURBO-TOP Pistons and exclusive cylinder head design squeeze more pulling power and mileage out of every drop of fuel.



ONLY GMC OFFERS *ALL THIS EXTRA VALUE*

***SUPER-DUTY* Valve-in-Head Engines with gas-saving TURBO-TOP Pistons Insulated RIDER-EASE Cabs with form-fitting seats and QUICK-VISION Instrument Panels • FRICTION-FREE Steering • SYNCRO-MESH Transmission (standard in heavy-duty models) • SEALED-BEAM Headlamps**

THE TRUCK OF VALUE

GMC TRUCKS

GASOLINE • DIESEL

cows a week and from 400 to 500 hogs. Mr. Aycock was at one time head salesman for Armour & Co., was the founder of Jackson (Tenn.) Packing Co., and general manager of a plant at New Albany.

Herbert Burch has been named president of Keystone Cooperative Grape Association, North East, Pa., to succeed A. C. Essenwein, resigned.

Fred E. Cunningham has been elected secretary of Campbell Soup Co., Camden, N. J., to succeed William D. Lippincott who will act as associate counsel for the company. Philip W. Souder was named manager of product research, and Frank E. Robb was made general purchasing agent to succeed Philip F. Nieukirk.

Charles A. Dunning, vice-president and a director of Ogilvie Flour Mills Co., Ltd., Montreal, has been named president.

Dr. R. E. Foerster, for the past two years a member of the scientific staff of International Pacific Salmon Fisheries Commission at New Westminster, B. C., has been appointed director of the Pacific Biological Station at Nanaimo, B. C.

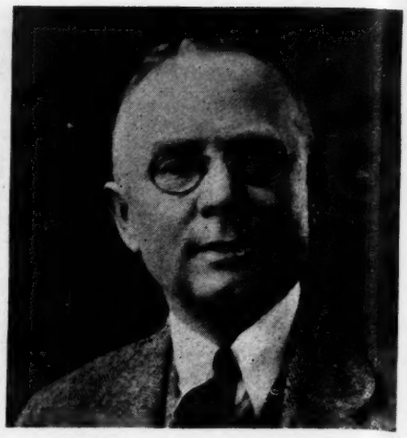
Harry G. Galloway has been elected president of Fletcher Coffee & Spice Co., Little Rock, Ark., to succeed the late John L. Deason. John Collins was named vice-president.

Carl F. Gierke, assistant district sales manager for Kraft Cheese Co. at Los Angeles, has been appointed head of the company's bulk cheese division in the eleven western states. His headquarters will be at San Francisco.

Continental by R.M.G., Inc.

EMIL H. SCHNEIDER

Formerly vice-president and superintendent, he has been elected president of Lion Brewery, New York. The company has plans for marketing a new kind of beer in the metropolitan area.



PROF. J. H. FRANDSEN

At its last annual meeting, American Dairy Science Association paid honorary tribute to Professor Frandsen in recognition of outstanding service to dairy science in America, particularly in the conception, advocacy and establishment of the* Journal of Dairy Science, *which he has edited and managed for eleven years. Professor Frandsen is head of the department of dairy industry at Massachusetts State College, Amherst. In 1907, he was appointed the first professor of dairy industry at the University of Idaho.

Sidney Grossman, of Linker Co., Louisville, Ky., has been elected president of Southern Wholesale Confectioners' Association, Inc.

J. F. McMahon has been advanced from manager of the Little Rock, Ark., branch of National Biscuit Co. to manager of the St. Louis branch.

Edward J. Noble, chairman of the board of Life Savers Corp., Port Chester, N. Y., has resigned as Under-Secretary of Commerce. He first entered government service in 1938 as chairman of the Civil Aeronautics Administration. It is reported that he will seek the Republican Senatorial nomination in Connecticut.

Dr. H. S. Paine of the Bureau of Agricultural Chemistry and Engineering has been placed in charge of an enlarged division of food research and carbohydrates.

Edward S. Rutter has become associated with M. & M. Bakeries, Inc., Dover, N. H. He was formerly with Larsen Baking Co., Inc., Brooklyn, N. Y.

Albert F. Saggese, secretary, has been advanced to vice-president and general manager of Flotill Products, Inc., Stockton, Calif. He has been directing the firm's eastern business for the past six years.

ANNOUNCING
A NEW COLSON CASTER
For Medium Weight Equipment

★ All-Steel Construction
★ Swivel bearing—two rows of ball bearings
★ All bearing parts hardened
★ Heavy, oversize king bolt
★ Patented lock nut
★ Accurate adjustment
★ Easy swiveling
★ One piece fork
★ Pressure lubricated wheel and swivel bearings
★ Rust resisting cadmium plate finish
★ Metal or rubber wheels
★ Also supplied in rigid fork models.

The Colson caster catalog is a complete caster buying guide. Send for your copy.

THE COLSON CORPORATION
ELYRIA, OHIO
Offices and Agencies in Principal Cities
CASTERS • INDUSTRIAL TRUCKS AND PLATFORMS • LIFT JACK SYSTEMS
Colson

DEATHS

Frederick G. Atkinson, 75, formerly vice-president of Washburn-Crosby Co. and more recently associated with Atkinson Milling Co., Minneapolis, July 22. He entered the employ of C. C. Washburn Flour Mills as office boy in 1880.

David H. Dugan, 81, founder and president of Dugan Bros. Bakery of New Jersey, July 31, at Mantoloking, N. J.

Dr. John R. Eoff, vice-president in charge of production of Jordon (Ont.) Wine Co., Ltd., Aug. 17. He was formerly in charge of research for Fruit Industries, Inc., San Francisco.

W. Edward Foster, 76, vice-chairman of American Sugar Refining Co., New York, Aug. 8. He started as office boy in 1883 with Havemeyer Sugar Refining Co., which later became part of American Sugar Refining Co.

S. R. Hornstein, 53, president of Coast Fishing Co., Inc., Wilmington, Calif., recently.

Henry Hudson Nicholson, 90, widely known chemical engineer who was called the father of the sugar beet industry in the Middle West, Aug. 17, at Kansas City.

John Roth, 83, founder of Roth Packing Co., said to be Omaha's oldest independent packing house, July 10.

ASSOCIATED INDUSTRIES

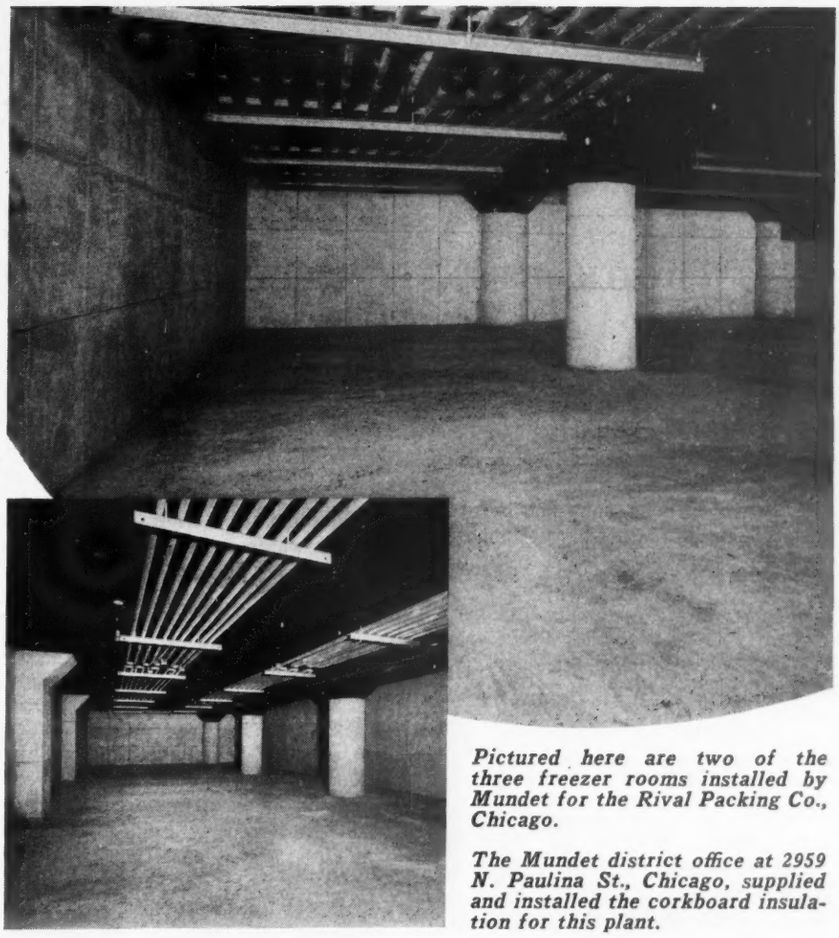
Aluminum Co. of America, Pittsburgh, has again reduced the price of aluminum one cent a pound, bringing it to 18 cents.

General Biochemicals, Inc., has moved from Cleveland to Chagrin Falls, Ohio, where a new office building has been constructed in connection with the laboratories and plant located there.

Machinery & Equipment Corp., New York, has been organized by Harry Pearlman and Irving H. Laskey as manufacturers' representatives and dealers in new and rebuilt machinery for the food and allied industries.

Smith-Lee Co., Oneida, N. Y., has appointed National Manufacturing Co., Kansas City, to handle distribution of milk-bottle hooding machinery west of the Mississippi.

Stein, Hall & Co., Inc., New York, is offering a new product called "Clarojel" which is designed to give more clarity and tenderness to the gumdrop type of candy.



Pictured here are two of the three freezer rooms installed by Mundet for the Rival Packing Co., Chicago.

The Mundet district office at 2959 N. Paulina St., Chicago, supplied and installed the corkboard insulation for this plant.

Economical Cold Storage

These cold storage rooms are well prepared to conserve low temperature. Layers of Mundet Cork Insulation in the walls, columns and ceilings make possible the precise and economical control of cold. • In all low temperature operations, Mundet Cork Insulation is a dependable barrier to heat infiltration. Through its efficiency the problems of temperature control are simplified and costs of operation reduced. Through many district offices, Mundet offers responsible engineering and installation services covering all phases of low temperature insulation. Recommendations and estimates are supplied promptly. • For helpful data on low temperature insulation, cork specifications and heat loss charts, write today to Mundet Cork Corporation, Insulation Division, 65 S. Eleventh St., Brooklyn, N. Y.

MUNDET
CORK INSULATION

CONSERVES LOW TEMPERATURE

Just off the Press

BOOKLETS • LITERATURE • BULLETINS

Food Plant Equipment

BAKERY EQUIPMENT—"The Relation of Good Scales to the Baking Industry" is the title of a booklet describing the use of weighing apparatus in baking operations, published by the Exact Weight Scale Co., Columbus, Ohio.

CORN POPPERS—A number of types of corn popping machines for use in the retail distribution outlet are described and illustrated in a 24-page bulletin just issued by C. Cretors & Co., 620 W. Cermak Road, Chicago, Ill.

GRAIN MILL MACHINERY—Three new bulletins describe the Niagara Super-Sifter, the Niagara Permaflux spout type magnet, and the Niagara Receiving Separator with Juby drive, all made by the Richmond Mfg. Co., Lockport, N. Y.

MATERIALS HANDLING EQUIPMENT —In Bulletin No. 240, a loader and piler for handling bulk material such as grain and salt is described and illustrated by Stephens - Adamson Mfg. Co., Aurora, Ill.

MATERIALS HANDLING EQUIPMENT —Traveling cranes and monorail systems of conveying are illustrated in a recent bulletin entitled "Three Divisions", issued by Cleveland Crane & Engineering Co., Wickliffe, Ohio.

MIXING EQUIPMENT—Model 422, Reco mixer for food products, in both bench and floor types, is described in Bulletin 4140 of Reynolds Electric Co., 2650 W. Congress St., Chicago.

MIXING EQUIPMENT—The Simpson Intensive Mixer, a mixer of the mulling type for use with dry, plastic, or semi-plastic materials, is the subject of a recent leaflet of National Engineering Co., 549 W. Washington Blvd., Chicago, Ill.

REFRIGERATION EQUIPMENT — A complete set of specification sheets for its line of condensing units and ammonia refrigerating machines, together with a number of folders showing applications of "Lipman" refrigerating equipment has been issued by General Refrigeration Corp., Beloit, Wis.

REFRIGERATION UNIT—Two horsepower water-cooled, 3-hp. water-cooled and 3-hp. air-cooled condensing units for refrigeration applications are illustrated and described in three bulletins published by Carrier Corp., Syracuse, N. Y.

SPRAYING EQUIPMENT — Catalog No. 77, a 32-page illustrated bulletin describing a complete line of spray equipment and air-motored agitators has been issued by Eclipse Airbrush Co., 398 Park Ave., Newark, N. J.

TANK CONSTRUCTION — "Lukens Flanging and Pressing" is the subject of Catalog No. 1—a 132-page illustrated catalog of tanks, tank heads and accessories issued by Lukens Steel Co., Coatesville, Pa.

VIBRATING SCREENS—Catalog 1762, a 20-page illustrated bulletin describing vibrating screens for handling a great variety of materials, has been issued by Link-Belt Co., 307 N. Michigan Ave., Chicago, Ill.

Plant Accessories and Supplies

ELECTRICAL EQUIPMENT — "Quick Selector" is the title of a 64-page catalog designed to aid in the selection of the correct apparatus for any motor, lighting or feeder circuit, published by Westinghouse Electric Manufacturing Co., East Pittsburgh, Pa.

ELECTRIC MOTORS — "Design and Operation of U. S. Single-Phase Motors" is the title of an eight-page educational bulletin published by U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles, Calif.

INDUSTRIAL STOKERS—The "Unistoker", a stoker suitable for application to industrial coal-fired equipment, is illustrated and described with application information in 24-page bulletin No. 600, of Detroit Stoker Co., General Motors Building, Detroit, Mich.

LIGHTING FIXTURES—Fluorescent lamp fixtures, Type RLM, with porcelain enameled reflectors are described in Leaflet 61-52 of Lighting Division, Westinghouse Electric & Mfg. Co., Cleveland, Ohio.

MIXER DRIVE — The "Unipower" Type M-40, a standardized driving unit with motor and reduction gears for mixing equipment, is described in a recent bulletin of the Patterson Foundry & Machinery Co., East Liverpool, Ohio.

MOTORS—Type CR, fractional and integral horsepower repulsion-start induction motors are the subject of "Descriptive Data 3113", issued by Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

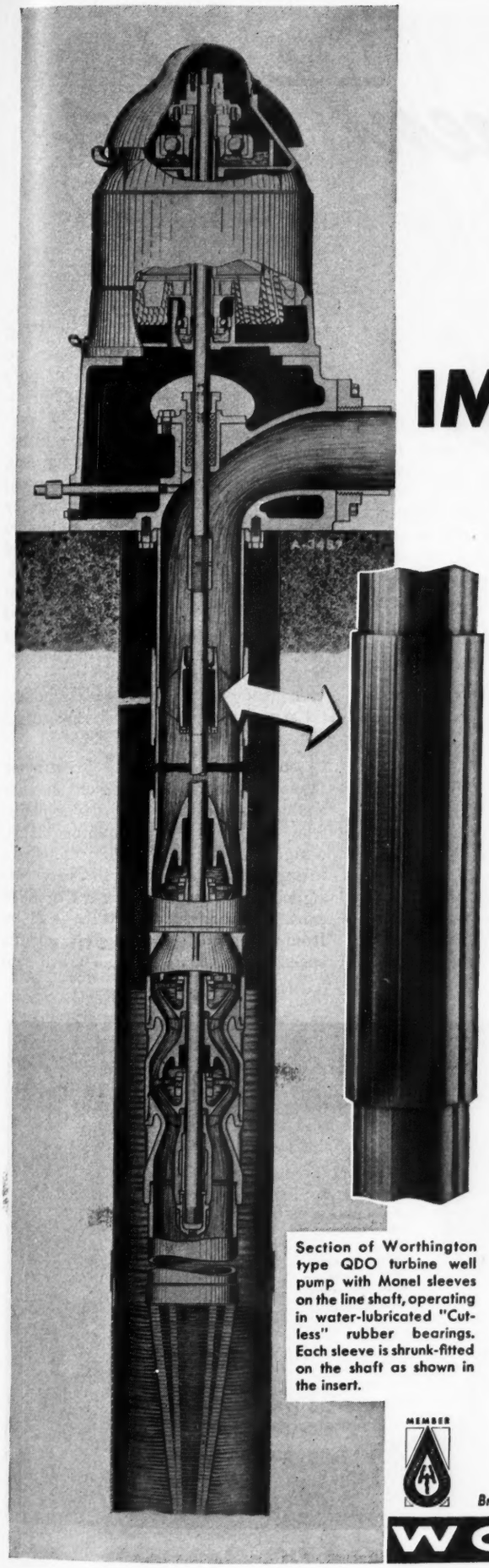
MOTORS—Synchronous motors and control for part-winding starting are described in Bulletin GEA-3345, issued by General Electric Co., Schenectady, N. Y.

STOKERS—Commercial and industrial bituminous coal stokers for boilers up to 300 hp. are among the various stokers covered in an eight-page tabloid size rotogravure catalog No. 1782 issued by Link-Belt Co., 307 N. Michigan Ave., Chicago, Ill.

SURFACE CONDENSERS—In Form 2622, Type R surface condensers designed for high vacuum and high efficiencies in small capacities are described by Ingersoll-Rand Co., 11 Broadway, New York, N. Y.

STEAM TRAPS—Thermostatic, expansion, weight-operated and piston-operated steam traps are described with specifications in 18-page catalog No. 240 of W. H. Nicholson & Co., Wilkes-Barre, Pa.

WINCHES—Hand and motor operated winches for lifting and pulling loads up to 3000 lb. are described and illustrated in Bulletin 340, issued by Stephens-Adamson Mfg. Co., Aurora, Ill.



Section of Worthington type QDO turbine well pump with Monel sleeves on the line shaft, operating in water-lubricated "Cutless" rubber bearings. Each sleeve is shrunk-fitted on the shaft as shown in the insert.

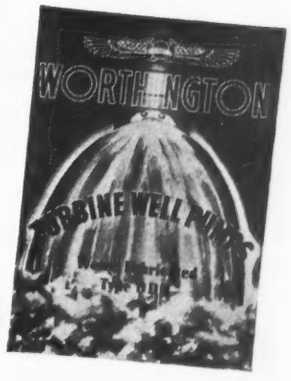
LUBRICATED BY WATER YET IMMUNE TO RUST

Worthington guards against corrosion and abrasion in its turbine well pump installations by using Monel sleeves on the line shafts at every bearing, to combine strength and toughness with resistance to corrosion and abrasion.

In Worthington water-lubricated turbine well pumps Monel shaft sleeves operate in "Cutless" rubber bearings installed at 10 foot intervals. This type of construction eliminates the necessity for a line shaft made entirely of a costly non-corrosive alloy metal.

In the Worthington turbine well pump line there is a type to meet YOUR requirements, whether your conditions call for water or oil lubrication.

These units are the product of the WORLD'S LARGEST PUMP BUILDER . . . one of America's pioneers in deep well pumping equipment.



FOR FULL DETAILS SEND FOR BULLETIN H-450-B29

MEMBER

WORTHINGTON PUMP AND MACHINERY CORPORATION
General Offices: **HARRISON, NEW JERSEY**
Branch Offices and Representatives in Principal Cities throughout the World

SWO-1

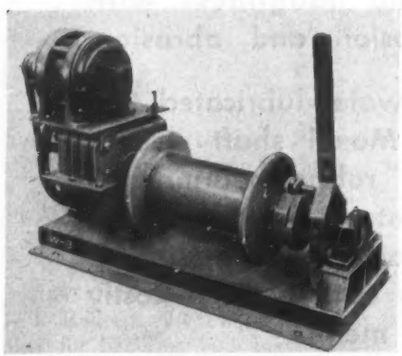
WORTHINGTON

Food Equipment News

REVIEW OF FOOD PROCESSING EQUIPMENT, ACCESSORIES, AND SUPPLIES

Speed Reducer Winch

STEPHENS-ADAMSON MFG. CO., Aurora, Ill. has brought out the "Saco" speed reducer winch. This is furnished in a variety of sizes from small to large capacity. One of its outstanding features is a jaw clutch which releases the pulling rope when disengaged. This feature is said to be very useful where it is necessary to carry the pulley rope a considerable distance before attaching it to the object to be moved, as it makes it unnecessary for the operator to run the



Winch with speed reducer incorporated.

winch in reverse while the rope is being paid out.

The speed reducer incorporated in this winch is a regular Stephens-Adamson Saco speed reducer. This permits the speed of the drum to be determined by placing the proper sized sheave on the motor drive shaft of the reducer, as the first speed reduction takes place through adjustable V-belt. The second reduction is through cut steel helical gears inside the housing of the reducer.

Factory Tractor

A STREAMLINED industrial tractor of modern design, affording the driver complete protection, has been developed by Clark Tructractor Div., Clark Equipment Co., Battle Creek, Mich. Named the "Clarkat," this tractor is capable of pulling 25 tons on trailers. It has an overall width of 38¼ in., a 57 in. turning radius and a speed of 8 miles per hour. Powered by gasoline motor, the tractor has a 4-gal. gas tank, said to be sufficient for 24 hours continuous operation. Equipment includes self-starter, hydraulic brakes and rear drive wheels, air cushion tires in rear, solid tires in front, and universal coupler which can be operated by the driver without dismounting. The design is such that the operator is protected by a half-inch steel body, but still has clear vision of his load and his right-of-way.

A larger model of the tractor is also available for use on damp and slippery floors, ramps, or for pushing heavy objects into position. This model has a capacity for pulling 40 tons on trailers.

All-Steel Valve

CRANE Co., Chicago, Ill., has brought out a new line of all-steel valves for steam and oil service. These valves are available in sizes from ¼ to 2 in. inclusive and the line includes gate valves, globe valves, angle valves and check valves. Both inside screw and outside screw and yoke construction are available with union or bolted bonnets and with screwed, socket weld or flanged ends. The total number of different valves in the line is 176.

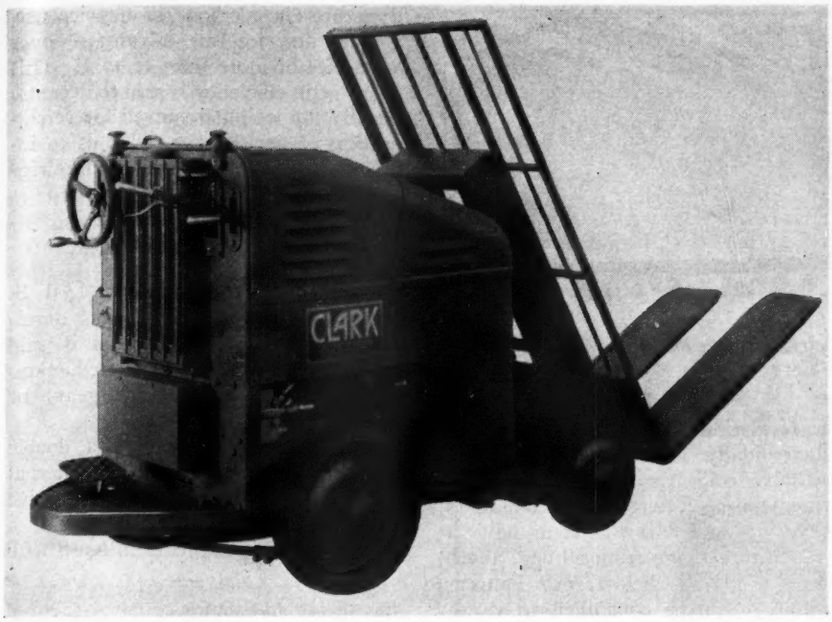
Metallic Paint

METALLIC COATINGS CORP., 236 West 44th St., New York City, claims to have developed a pigment of pure metallic copper with sufficient oil absorption power to make it a true pigment. A new vehicle has been developed to use with this pigment, which has properties of fast initial setting and complete hardening by polymerization. The result is a metallic copper enamel for which is claimed unusual resistance to acids, alkalis, saline solutions, gases, fumes, moisture, light, heat, and cold. It is recommended by its makers for the protection of metal and wooden surfaces.

Truck for Canners

CLARK EQUIPMENT Co., Tructractor Division, Battle Creek, Mich., has introduced a special power-driven industrial truck for use in canning plants, designated as Code "Pack". This is a tilting fork truck, particularly designed for transporting trays of filled cans. Its capacity (3,000 lb. at 21 in. from the heel of the fingers) and its speed (from 1 to 9 m.p.h.) are said

Gasoline-powered factory tractor of 25 tons hauling capacity.

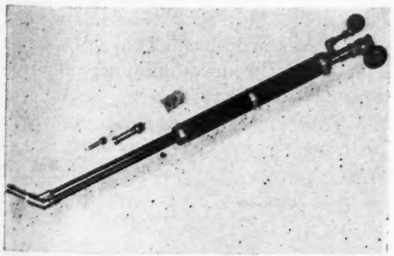


Fork truck especially designed for canning plants

to enable it to handle large tonnages in minimum time and at low cost. Wide tires and low center of gravity permit it to negotiate uneven floors with ease. The outside turning radius is 104 in., permitting it to turn around in the intersection of 77 in. aisles. The thin broad forks have been specially designed for handling trays of canned goods, which may be tilted backwards 30 deg. for safe riding and tilted forward 2 deg. for easy spotting.

Steam Cleaning Gun

FOR CLEANING food processing equipment, Oakite Products, Inc., 26G Thames St., New York City, has developed an improved type of steam cleaning gun. This is called the "Solution-Lifting Steam Gun." Its basic feature is ability to lift the cleaning solution automatically from floor level to a working height of 12 ft. without the aid of pumps, injectors, gravity feed tanks or other auxiliary apparatus.



Steam cleaning gun of "solution lifting" type

In operation this gun requires a supply of steam at 30 lb. or more pressure. Equipped with a sufficient length of good grade steam hose to reach from the steam supply and with a solution hose long enough to reach from the cleaning solution container, it is ready to go to work.

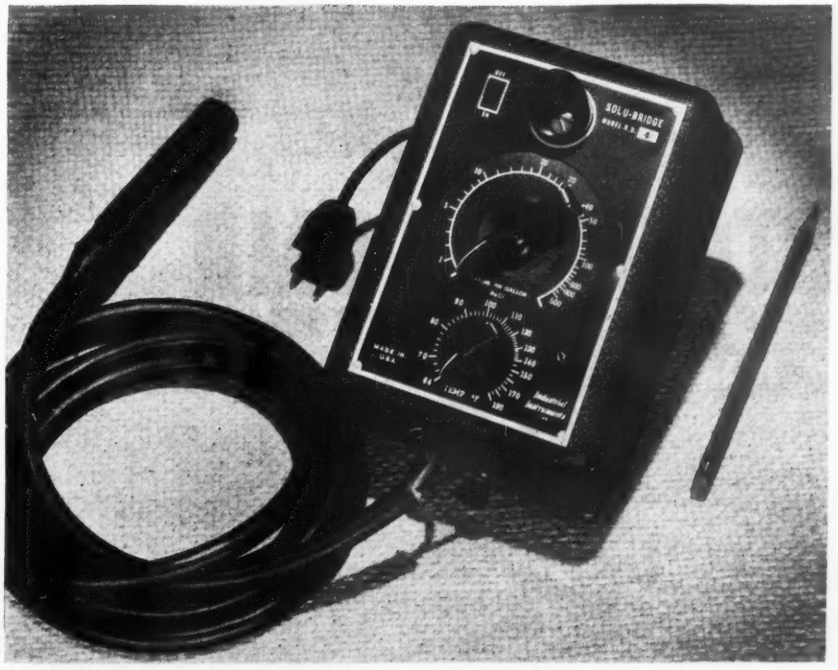
Four sizes are available, ranging from 3½ ft. to 6½ ft. in length.

Plugging Switch

GENERAL ELECTRIC Co., Schenectady, N. Y., has introduced a plugging switch for controlling motor stopping. This switch operates to reverse the power connection and bring the motor to rest quickly by its tendency to run in the reverse direction. The switch also removes this reverse or "plugging" power at the correct moment to keep the motor from re-accelerating in reverse direction.

Rinsing Water Tester

INDUSTRIAL INSTRUMENTS, INC., 156 Culver Ave., Jersey City, N. J. has brought out the Model RD-4 Solu-Bridge. This is a device for testing the concentration of tap waters, boiler feed and rinsing waters and it is particularly adapted for use in connection with bottle washing in the dairy, brewery and soft drink industry. In operation it is plugged into a 110 volt, 60 cycle outlet and the conductivity cell is dipped into the liquid which is to be tested. The machine dial is then rotated until the shadow in the "magic eye" on the machine is at a maximum. The dial then reads directly in concentration in grains per gallon. The instrument covers a range of 1 to 500 grains per gallon and is provided with a temperature compensation dial covering a range from 64 to 190 deg. F.



Instrument for measuring concentration of rinsing waters.

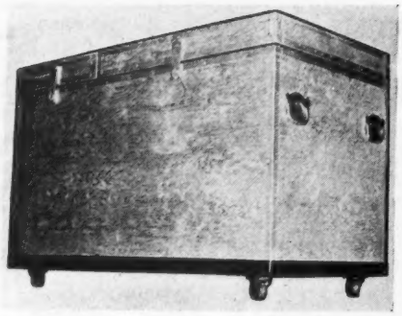
Transit Refrigerating Unit

FOR REFRIGERATED transportation of foods, C. W. McCoy has developed a thermostatically controlled transit refrigeration system which makes use of units suitable for either railroad or

truck transportation. These units are produced under patents covering the McCoy temperature controlled dry ice refrigeration system, held by the Toone-McCoy Corporation, Portland, Ore. The units are now being made under license by Northwestern Dry Ice Co., Salem, Ore.. Other licenses are expected to be taken so that this equipment will be generally available.

These units are refrigerated by a system in which dry ice serves both as a cooling medium and as a source of power to circulate a secondary refrigerant. As is well known, when dry ice gives up its cold, it forms a gas. When this is accomplished in a closed chamber, pressure builds up. In this unit, this pressure is used to operate a diaphragm pump which causes a cooled circulating medium, refrigerated by the dry ice, to be circulated through the insulated container. The action of the pump is controlled by a valve that is thermostatically regulated from within the container.

In order to conserve the heat absorbing capacity of the dry ice and to regulate the gas pressure, actual cooling of the circulating refrigerant is done by the gas in excess of power requirements. Before this gas is allowed to escape it is carried through



Refrigerated cabinet using the McCoy dry ice system.

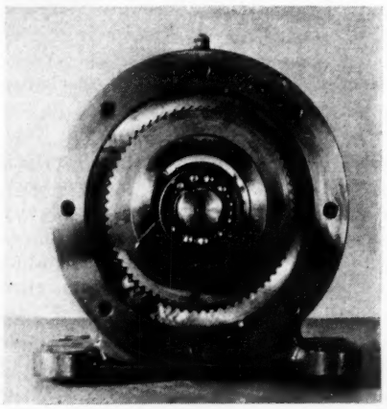
the insulation of the container so that when finally expelled, most of the available cold has been used for refrigeration. Refrigerated containers operating under this system have a temperature range from 50 deg. above zero to 30 deg. below zero Fahrenheit, and can be controlled to variations of only 3 deg. throughout the storage compartment.

Test runs, using this refrigerated container, have been made by Consolidated Freightways, Cascade Fast Freight, United States Department of the Interior, Bureau of Fisheries, and others. It is claimed by the patent holders that performance tests show an increased efficiency of 90 per cent over present methods of dry ice use, giving dry ice an advantage over water ice of more than 15 to 1. This increase in efficiency is said to decrease greatly the weight required for refrigeration of perishables and thus to increase the possible payload in refrigerated transit equipment.

Speed Reducer

BRAD FOOTE GEAR WORKS, 1301 S. Cicero Ave., Cicero, Ill., has developed a speed reducer which is said to give high ratio speed reductions without the use of large gears or drives.

This reducer consists of a double spur or combination spur and internal gear which is mounted on a drive shaft eccentric and meshes with a stationary internal gear. In mesh with



High ratio speed reducer.

the secondary gear is either a spur or internal gear which is solidly connected and concentric with the output shaft. The eccentric gear on the drive shaft drives the initial spur around the pitch line of the stationary internal gear. Since the initial spur and the secondary gear are solid, the speed of the latter is controlled by the ratio between the two. To obtain large ratios a small difference in number of teeth between these two gears is used. This makes the pitch line of the spur gear almost conform to that of the internal gear, as can be seen from the accompanying illustration. In this way a large number of teeth are engaged at one time which increases the load carrying factor. Efficiencies are said to range between 70 and 90 per cent with reduction ratios from 20:1 to 7,500:1.

Fluid Impact Mill for Disintegration and Dispersion

ASBURY RESEARCH DEVELOPMENT, Wyncote, Pa., has developed a new type of mill for processing all sorts of fluid mixtures. This mill operates by means of specially designed

STERLING PUMP
HAS MOVED CLOSER TO YOU!
HAMILTON, OHIO
To serve you better we are now at The *Center of Industry!

STERLING PUMPS ARE MANUFACTURED FOR EITHER OIL OR WATER LUBRICATION

Write—without obligation, for consultation with our engineering staff regarding your special pumping problems.

Now we are not only geographically closer to your needs, but our improved manufacturing and transportation facilities assure still better service.

And here, in Hamilton, Ohio, we have one of the most complete pump manufacturing plants, testing laboratories and engineering staffs in the world.

With greater efficiency in manufacture and lower transportation costs, it is obvious that dollar for dollar you now get greater value than ever before.

PRECISION BUILT
STERLING
DEEP WELL TURBINE PUMPS
WRITE FOR CATALOG TODAY!

STERLING PUMP CORPORATION
Hamilton, Ohio Stockton, Calif.

rotors which produce impacts through centrifugal force. The rotors, operating in successive stages, divide the liquid materials into the form of a fine mist, the particles of which are driven by centrifugal action at high velocity against impact rings, which guide the fluid film so formed into the next succeeding rotor.

In operation, there is no contact between stator and rotor and hence no grinding type of action. This is said to utilize the energy in disintegrating the material and not in the production of heat through friction.

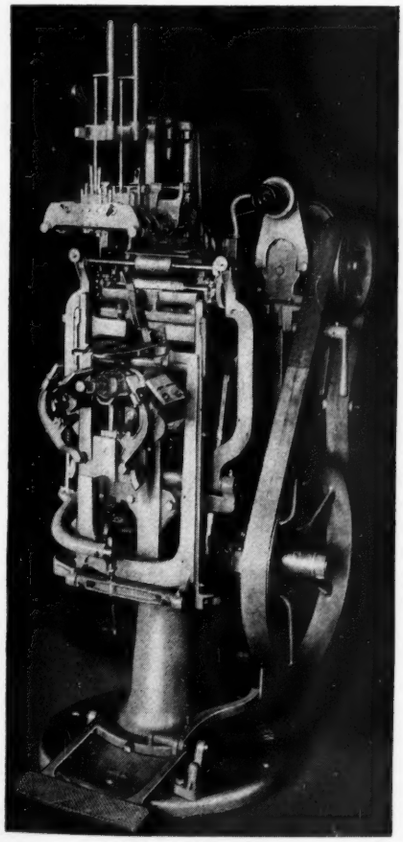
In addition to disintegrating operation, this mill is suitable for use in making emulsions of such materials as vegetable and animal oils.

Labeling Machines

Economic Machinery Co., Worcester, Mass., has brought out the Model S "World" labeler which is equipped to apply body and neck labels and foil to bottles in one operation.

Extreme flexibility is claimed for this labeler, in that it will label any size of bottle from a small vial to a gallon jug. It will apply front or back labels or labels that go all around the jar or bottle.

The labeler is semi-automatic in operation and is equipped with silent motor drive. The gum roll is driven



Flexible labeling machine for semi-automatic operation.

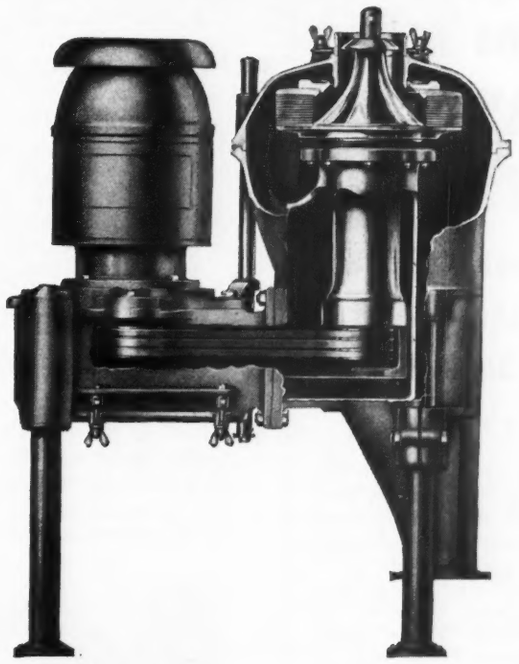
Protect your GOOD WILL against INSECT INFESTATION with

The BULK FLOUR

ENTOLETER

INFESTATION DESTROYER

REG. U. S. PAT. OFF.



INSECT LIFE IN ALL STAGES: EGG, LARVA, PUPA AND ADULT IS DESTROYED *MECHANICALLY* JUST BEFORE THE FLOUR PASSES TO THE PACKERS LEAVING SLIGHT CHANCE FOR REINFESTATION.

ENTOLETE *your flour*

DESTROY INSECT INFESTATION AS PART OF THE MILLING PROCESS

Inexpensive

Easy to install and operate

Minimum Maintenance

ENTOLETER DIVISION

THE SAFETY CAR HEATING AND LIGHTING COMPANY, INC.

230 PARK AVENUE NEW YORK, N. Y.

WHEN YOU NEED A
ROTARY PUMP
Right Now...

First Check VIKING'S
Complete Line of
Standard Stock Pumps!

• • •

Whenever you find yourself in that "spot" where you need a rotary pump in a hurry—your best bet is Viking. Their line of standard stock rotary pumps is the most complete in the world . . . they present a wide selection of mountings, capacities and drive arrangements. "Special" pumping assignments can often times be efficiently handled with Viking stock pumps—a saving to you of both time and money.

Write today for Bulletin 103-35 . . . it's packed with photographs and detailed technical information on Viking Standard Stock Pumps, designed and built for the handling of food factory products. And the next time you need a rotary pump on a moments notice, check this Bulletin first.

LOOK FOR THIS TRADE MARK—THE SIGN OF GENUINE VIKING

VIKING
PUMP COMPANY
CEDAR FALLS, IOWA

by a roller chain with cut sprockets. Follower rod lips check the upward pressure of the labels when the pickers are in contact with the labels in the label holder.

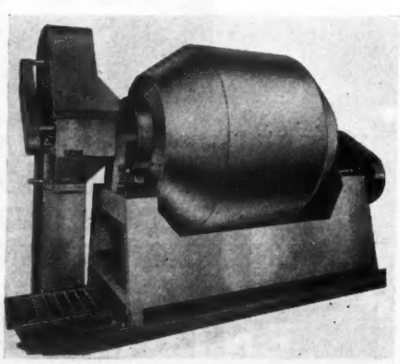
In operation, the operator places the container which is to be labeled in the container holder and then presses the foot pedal. The labeler can be operated continuously by locking this treadle in down position.

Coating and Dust-proofing for Floors

WILBUR & WILLIAMS CO., Park Square Bldg., Boston, Mass., has developed a material known as "Dye-Crete," for producing a hard, permanent and non-dusting surface coating on the floors of such plants as breweries and dairies. In addition to being resistant to wear, this material forms a coating on the floor which resists attack by alcohol, grease, oil, water or dilute chemicals. In addition, the material can be obtained in four colors, green, red, gray or brown, to suit the scheme of decoration used in the plant.

Horizontal Mixing Machine

PRATER PULVERIZER CO., 1811 S. 55th Ave., Chicago, Ill., has developed a mixing machine which operates on the principle of cut—divide—remix. Rated at one-ton capacity and of the horizontal drum type, this mixer embodies

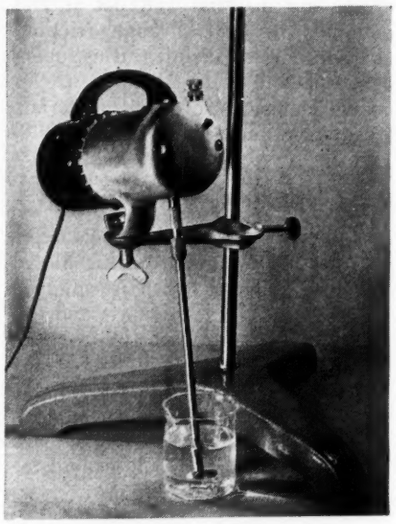


Horizontal mixing machine.

a new combination of mixing and lifting blades and dual spirals running in opposite directions inside the drum. By means of these, the material in the mixing cycle is interrupted and changed in course 26 times per minute. The mixing and lifting baffles are offset, so that they alternately collect loads from opposite ends of the drum and feed them evenly back to the spirals. These spirals, revolving in opposite directions, again divide the load and each spiral carries its portion to the opposite end of the drum. With six baffles and two spirals operating in a drum revolving 4½ times per minute, it is said that complete mixing is accomplished rapidly.

Laboratory Mixer

MIXING EQUIPMENT CO., INC., 1062 Garson Ave., Rochester, N. Y., has developed the Model F laboratory mixer, which embodies an adjustable speed friction drive. This drive provides constant horsepower at the propelled with increasing torque at slow speeds. By adjustment of a thumb



Laboratory mixer with friction drive.

screw, speed is increased up to the maximum of 1750 r.p.m. or decreased until the mixer is barely turning over. Because of the friction drive through which this is accomplished, there are no gears embodied in the device nor is there any rheostat.

This new mixer is available for 110 or 220 volt, 60 cycle, one phase current.

Motor Lubrication System

U. S. ELECTRICAL MOTORS, INC., Los Angeles, Calif., has developed an oil lubrication system which is now being supplied on all its open type SA and Uniclosed type SC motors larger than 30 hp., 3600 r.p.m. and 75 hp., 1800 r.p.m. In this system, an oil gage is supplied on all of the oil lubricated motors. This gage is marked with maximum and minimum level for easy checking. The manufacturer states that application of oil lubrication brings longer bearing life because of better lubricating properties of oil as compared to grease and consequently less wear on the bearings. It is claimed that this method gives complete and thorough lubrication at all times since the oil level is maintained just slightly over the outer race of the bearing, with the result that sufficient oil is always present and yet the bearing is never over-

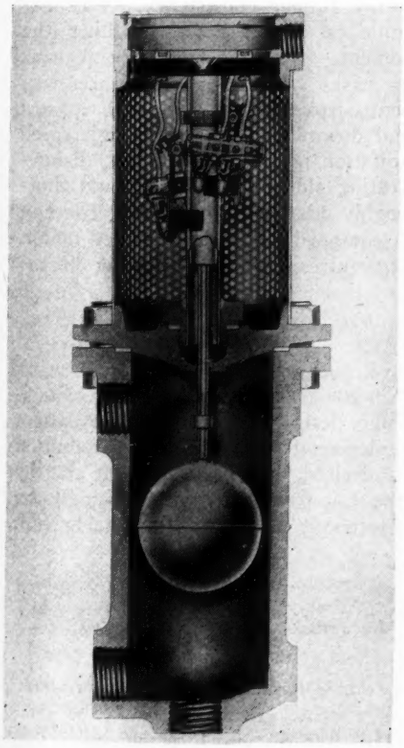
loaded with oil. This condition is said to result in a cool operating bearing. Also, in maintenance work on these motors, costs are said to be reduced because the bearing can be better cared for, as the housing may be flushed frequently without any disassembling of the motor.

Power Units

INTERNATIONAL HARVESTER Co., 180 N. Michigan Ave., Chicago, Ill., has recently brought out two new power units. Model U-2 is a 22-hp. 4-cylinder engine, which operates on gasoline, natural gas, distillate or kerosene. This engine is governed to operate at speeds from 1,000 to 1,800 r.p.m. and can be closely regulated at 1,200 r.p.m. for direct connection to an electric generator. The other model is a 6-cylinder diesel engine designated as Model UD-18. This engine starts on gasoline and then shifts to diesel operation. Normal operating speed is 1,400 r.p.m. The design is suitable for heavy duty service.

Liquid Level Control

FRED. H. SCHAUB ENGINEERING Co., 325 W. Huron St., Chicago, Ill., has introduced a liquid level control called the "Schaub Magnetrol." This controller, which is shown in the accompanying photograph, is of the float type with the float controlling a



Liquid level control operating through float and mercury switches.

32° Water—Instantly

Yet Increases Your Compressor Capacity!

Cutaway view showing placement of cooling sections in tank. Arrows indicate short refrigerant gas flow.

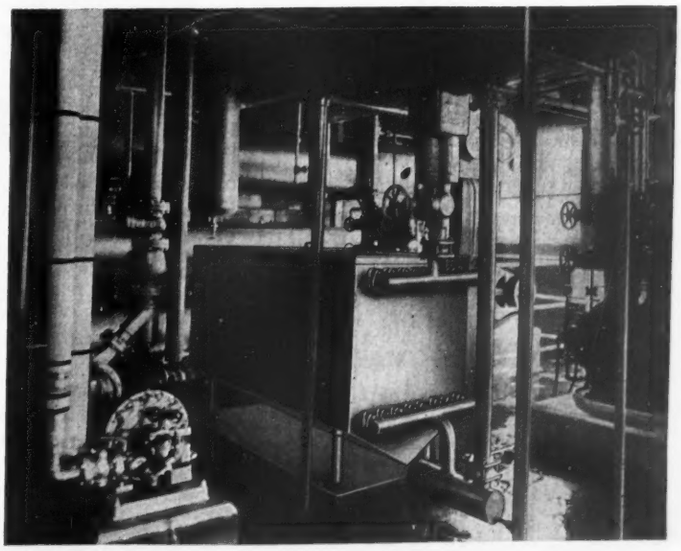
HERE'S a cooler that not only cools water to 32° with no danger of cooling sections freezing up, but will increase the tonnage output of your compressor—in some cases as much as 50%. How? Because you can use higher back pressures!

Jensen Chilled Water Units use a patented "short gas flow" feature which allows the refrigerant gas to escape *instantly!* This means the refrigerant temperature is *uniform* throughout the section. That's why it's so efficient . . . why you can use higher temperature refrigerants—yet cool to lower temperatures at less cost!

Built in sizes to handle 300-tons down to a fraction of a ton, the Jenson Chilled Water Unit may be operated on the recirculating principle or on a "once-over" basis.

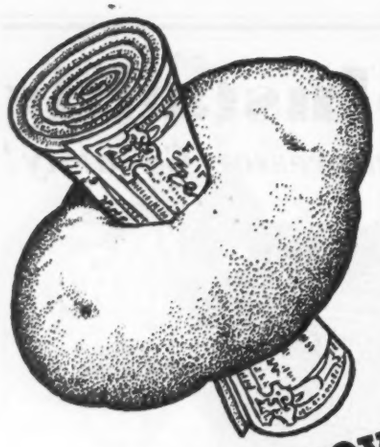
Save money by cooling the "Jensen Way." Write for bulletin 48. **Jensen Machinery Company, Inc., Bloomfield, N. J.; Chicago, Ill.; Oakland, Calif.**

JENSEN



Jensen Recirculating Chilled Water Unit installed in Gordon Baking Company's Salamanca, N. Y., plant. Unit contains eight cooling sections handling up to 62.5 tons of refrigeration per hour.

JENSEN CHILLED WATER UNITS



There's Money in it!

The difference between the cost of a pound of potatoes and the price of a pound of chips is a tidy sum. Multiply it by means of a machine that turns out up to 350 pounds of super-quality chips per hour and you get an idea of the profit possibilities of

FERRY CONTINUOUS POTATO-CHIP MACHINES

You simply fill hopper with raw unpeeled potatoes, "press a button and we do the rest!" Out of the adjustable delivery chute comes a golden stream of uniformly perfect chips—crisp, dry, tender, and salted to the Queen's taste . . . Hour after hour, day after day the product of a Ferry Machine never varies from top quality—no rancid chips, no soggy ones. And, better yet, production costs are far lower than with other methods of manufacturing . . . Made in 5 sizes to suit your needs, with capacities from 50 to 350 lbs. of chips per hour. Write us today for illustrated bulletin.

ALSO MAKERS OF:

SLICERS & AUTOMATIC SLICER FEEDERS

CAN WASHING MACHINERY

J. D. FERRY CO.

129 SO. CAMERON ST.

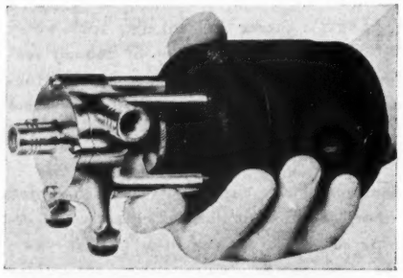
HARRISBURG, PA.

switching action. As the float moves up and down in an inclosing tube, it causes an attached piston to rise and fall. As the piston reaches a predetermined level, it comes into a magnetic field produced by a permanent magnet located on the outside of the tube. When this occurs, the magnet is drawn towards the piston, causing a tilting action in a mercury switch which is part of the magnet relay arm.

Two models of this controller are available. One has a single switching action which may be used as a low water cutoff or to operate a pump, or to energize an electrically operated valve. The other model has three stages of liquid level control for use as a low water cutoff, pump control and high water cutoff on boilers, or for stage control on other liquid level applications. An alarm circuit may be incorporated in either of these models.

Midget Centrifugal Pump

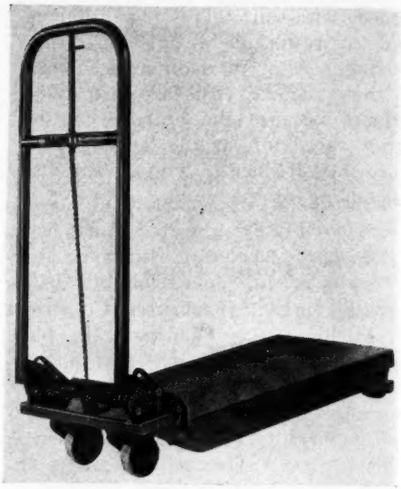
EASTERN ENGINEERING Co., 45 Fox St., New Haven, Conn., has added a new pump, Model E, to its line of small centrifugal pumps. This unit weighs 6 lb. and is 7½ in. long x 3¾ in. high x 3¾ in. wide, including the 1/20 hp., 115 volt universal motor. Maximum pressures developed are 20 to 25 lb. per sq. in., and maximum volume delivered is 8 gal. per minute. It is adapted to the pumping of thin liquids. Monel metal, stainless steel or chromium plated bronze construction are optional, with other metals or alloys available if needed.



Small sized centrifugal pump

Hand Lift Truck

A HAND-OPERATED factory lift truck known as the "Half-Ton" has been added to its line by Barrett-Cravens Co., 3250 W. 30th St., Chicago, Ill. This is a general purpose lift truck designed for handling lightweight items in industrial trucks and warehouses. It serves as a combination lift truck with full 2-in. lift for big loads that are handled on skids, and as a floor truck for single objects such as barrels, cases, bales, etc. Equipped with four ball bearing wheels, the truck has front wheels of swivel type for steering. The handle is of tubular steel and operates the lifting mechanism when pulled down to an angle slightly more than 45 deg. The truck platform is lowered by pulling the chain which can be seen attached to the handle in the accompanying photograph.



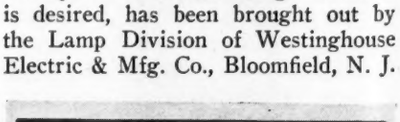
Lightweight hand operated lift truck for general purposes.

Conditioning Machine

LANDON T. SMITH, INC., Irvington, N. J. is manufacturing the Model 33 electric conditioner for conditioning mayonnaise and heavy liquid or paste-like foods requiring severe agitation to secure proper consistency. The machine is designed for handling the contents of 5 gal., 3 gal., 2 gal. cans or cases of bottles. Its three-way shaft stroke motion—outward, upward and downward—creates a high speed agitation inside the container, disintegrating side wall sediment and thoroughly mixing the contents. The unit is equipped with ⅓-hp. inclosed motor. It requires a working space of 39x15½ in.

Sterilamp Fixture

A NEW FIXTURE for the 30-in. Sterilamp, designed for use in places where widespread bacteria-killing radiation is desired, has been brought out by the Lamp Division of Westinghouse Electric & Mfg. Co., Bloomfield, N. J.



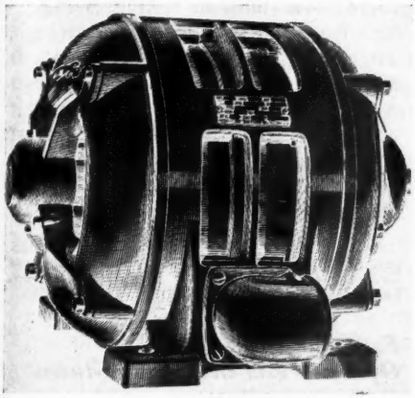
Fixture for use with 30-in. Sterilamp.

The fixture, which is shown in the accompanying photograph, operates an ordinary 110-120 volt, 60 cycle, a.c. It

is constructed of aluminum with Alzac finish for a hard highly reflective surface. Because the finish is resistant to corrosion, the fixture is suitable for use in refrigerators and other places having high humidity. Special care has been taken in the design to provide safety when lamps are replaced.

Electric Motor

LOUIS ALLIS CO., Milwaukee, Wis., has brought out the "Lo-Amp" electric motor especially designed for use on refrigerating, air conditioning and similar installations. A feature of this motor is the low-locked rotor current. It can be supplied with either high starting torque or normal starting torque. The manufacturers claim for this motor the simplicity of a standard squirrel-cage motor and that it does



Electric motor designed especially for use on refrigerating and air conditioning installations.

not have any centrifugal switches, relays, brushes or slippings. Nor does the motor require special control equipment such as multi-step starters.

Fluid Meter

COCHRANE CORP., 17th St. and Allegheny Ave., Philadelphia, Pa., has brought out the "Linameter" for the measurement of fluids that have characteristics of viscosity, corrosiveness, etc., beyond the scope of other meters. It is of the area type and is installed as a part of the pipeline. Within the meter is a weighted disk positioned by the velocity of fluid flow through a tapered throat section so that disk travel is directly proportional to flow rate. Attached to the disk are a rod and weighted core. The core traverses the field of two reactance coils surrounding the pressure tight tube of the meter body.

These coils form a reactance bridge when connected electrically to similar coils in the indicating, recording and integrating instrument, and form the means of transmitting flow measurements to any desired point.

PEST CONTROL?

"We're getting better results and our costs are lower, too."

..."Wish we had put an I.F.E. on the job sooner."

HAVE you checked up on *your* insect control problems recently? If not, it may pay you well to let an Industrial Fumigation Engineer do this job for you.

Many managers of foodstuffs manufacturing plants have found that by turning the entire job of insect and rodent control over to one of these experienced Industrial Fumigation Engineers, *their costs have been reduced* and their *results are considerably better.*

The reasons are not hard to find —an Industrial Fumigation Engineer is an expert in his line. He knows insects, their habits, life cycle, and how to control them at all stages. His experience includes fumigation under all kinds of conditions, with all types of fumigants. He is prepared to take over the entire responsibility for pest control in any plant. His own operators are thoroughly trained for their jobs. He carries Fumigation Liability Insurance for your protection. He will supply the equipment and materials that are required for every condition.

Cost? Let the Industrial Fumigation Engineer give you an estimate. Write us and we will be glad to put you in touch with the one nearest you or to send you any additional information you wish about this new service.

THE FUMIGANT?

• Without doubt the most widely used fumigant today is hydrocyanic acid gas. LIQUID HCN is hydrocyanic acid gas in the cleanest, most effective and the most versatile form. Ways and means of applying LIQUID HCN effectively to any industrial fumigation problem are available through the Industrial Fumigation Engineer. That is why LIQUID HCN is the fumigant of choice with him — because it enables him to get results —complete insect control. And results are what count with the plant manager or mill superintendent. Here, then, is an unbeatable combination:— An Industrial Fumigation Engineer who knows *how*, using a fumigant that gets *results.*

American Cyanamid & Chemical Corporation

INSECTICIDE DEPARTMENT

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

KANSAS CITY, MO. • AZUSA, CALIF.

Food Technology

NEW DISCOVERIES & INVENTIONS

FOOD TECHNOLOGY

Dust Hazards

THE FOLLOWING MATERIALS sometimes found around food plants have been discovered to form explosive mixtures with air:

Fertilizer dust	Sawdust—sand mix-
Walnut shell	ture (floor sweeping
Flour	compound)
Cocoa	Insecticide mixture
Malt dust	containing walnut
Dried blood	shell, flour, derris and
Alfalfa meal	wheat flour

Digest from the report of the Chief of the Bureau of Agricultural Chemistry and Engineering, U. S. Dept. of Agriculture, 1939.

Aeration in Fermentation

IN THE acetic acid fermentation process for making vinegar, and in several industrial processes which are modifications of the vinegar fermentation, aeration is an important aid to operating efficiency. Examples of modified fermentations are the production of sorbose from sorbitol, acetol from propylene glycol and gluconic acid from glucose.

The rotary drum method of aeration is an important contribution to the art, but only 40 to 45 per cent of the total drum capacity can be utilized. A simpler method has been developed which has been successful on a laboratory scale. The mash is aerated with fine bubbles formed by forcing air through sandstone or porous ceramic ware, immersed in the mash in a cylindrical fermenter. The efficiency of aeration depends on the pore size of the porous blocks (i.e., on the size of the bubbles) and on the shape and size of the fermenter in relation to the porous blocks.

In yeast fermentations, aeration is concerned with much more than efficiency; it alters the course of fermentation, directing it toward yeast production and away from alcohol production. Thus, large quantities of protein can be produced, with little or no alcohol. The porous method is also adaptable to this type of fermentation.

Digest from "Effect of Aeration on Fermentations," by K. R. Butlin and W. H. D. Wince, *Chemistry and Industry* 59, 41, 1940 (Published in England).

BAKING & MILLING

Bleaching Flour

IMPROVED APPARATUS for bleaching flour or other milling products with nitrogen trichloride is disclosed in British Patent 508,773 (granted to Adrianus Kleijn of Rotterdam, Netherlands; complete specification accepted July 5, 1939). The bleaching gas (nitrogen trichloride) is generated chemically by continuous addition of a reagent to a liquid which yields the gas. The generator chamber is divided in two parts by a partition extending downward from the lid to a point below the normal liquid level. The cover and the partitioned reaction chamber are so fitted with air and gas connections that air is continuously mixed with the evolved nitrogen chloride in a proportion suitable for bleaching flour. The mixture of air and nitrogen chloride, drawn off from the generator, is used as the bleaching agent.

Alginates in Baking

ACCORDING to Canadian Patent 389,161 (granted June 4, 1940, to Roger W. Ament and assigned to the Kelco Co., Los Angeles, Calif.), beneficial results can be obtained in baking by adding an edible, soluble alginate to the dough. A preferred procedure for using soluble alginate in this way is to incorporate 0.25 percent to 0.5 percent by weight of ammonium alginate (calculated on the weight of flour) in a paste of water and flour, after which other ingredients are introduced and the mixture is worked into a dough. An ammonium alginate preparation, having a high viscosity in aqueous solution at relatively low concentrations, is recommended for the purpose.

Milk Bacteria in Bread

SELF-SOURED whole or skim milk, diluted with one-fifth its volume of water, is entirely satisfactory for making "milk bread." Yoghurt skim milk can be used equally well, but needs three times as much water for dilution. Rye bread with a particularly attractive aromatic flavor can be made from a yeast dough by using yoghurt skim milk. The bacterial flora of milk, and particularly the lactic acid bacteria, have an important influence in bread, especially rye bread. Lactic acid helps to prevent the growth of undesirable bacteria, and the dough fermentation should be conducted so that at least twice as much lactic acid as acetic acid is present. Another factor in the use of sour milk in baking is important from the standpoint of nutrition, namely the introduction of casein as one of the proteins in bread. In tests with wheat flour and yoghurt milk it was found that the highest yoghurt effect was obtained when yoghurt milk constituted 80 percent of the total dough liquid.

Digest from "Flour and Lactic Acid Bacteria," by Mohs, *Zeitschrift für das gesamte Getreidewesen* 27, 1, 1940 (Published in Germany).

Erroneous Theory Of Syneresis in Wheat Gluten

SYNERESIS (gel shrinkage) of gluten is often cited as a cause of certain changes in dough. Tests with gluten from several European and Canadian wheat flours showed that gluten gels are characterized by syneresis reaching exceptionally high numerical values, and that the course of syneresis depends a great deal on the nature of the flour from which the gluten was obtained. But it is a mistake to suppose that syneresis occurs in dough because it is so prominent in isolated gluten gels. On the contrary, the tests show that when gluten is dispersed in flour, as it is in doughs employed in baking bread, syneresis is prevented by the soluble substances in flour. They enter into the liquid phase in the dough and prevent syneresis from taking its usual course in the gluten component of the system. Indeed, syneresis could be almost completely prevented in an isolated gluten gel merely by adding the water extractives from flour in only one-twentieth of the concentration in which they occur in dough. Hence the changes in dough which have been attributed to syneresis of gluten must now be explained on some other basis.

Digest from "Syneresis of Wheat Gluten," by E. Baron, *Chimie et Industrie* 43, 277, 1940 (Published in France).

COLD STORAGE

Chemical Change In Stored Apples

To ASCERTAIN why ripe Bramley's seedling apples deteriorate rapidly at 33.8 deg. F. whereas they remain sound at 41 deg. F., comparative storage tests were made at both temperatures. Since it is known that atmospheric carbon dioxide accelerates functional breakdown and death of tissue in these apples at temperatures below about 37.4 deg. F., the tests were made in atmospheres with known partial pressure of oxygen and of carbon dioxide, and the results were studied by determining total sugar and starch and the rates of loss therein, and loss of acid.

In one test series, oxygen concentration was varied from 2.5 to 21 percent in the presence of 0.5 percent of carbon dioxide; in another series, carbon dioxide was varied from below 0.5 to 15 percent in the presence of 10 percent of oxygen.

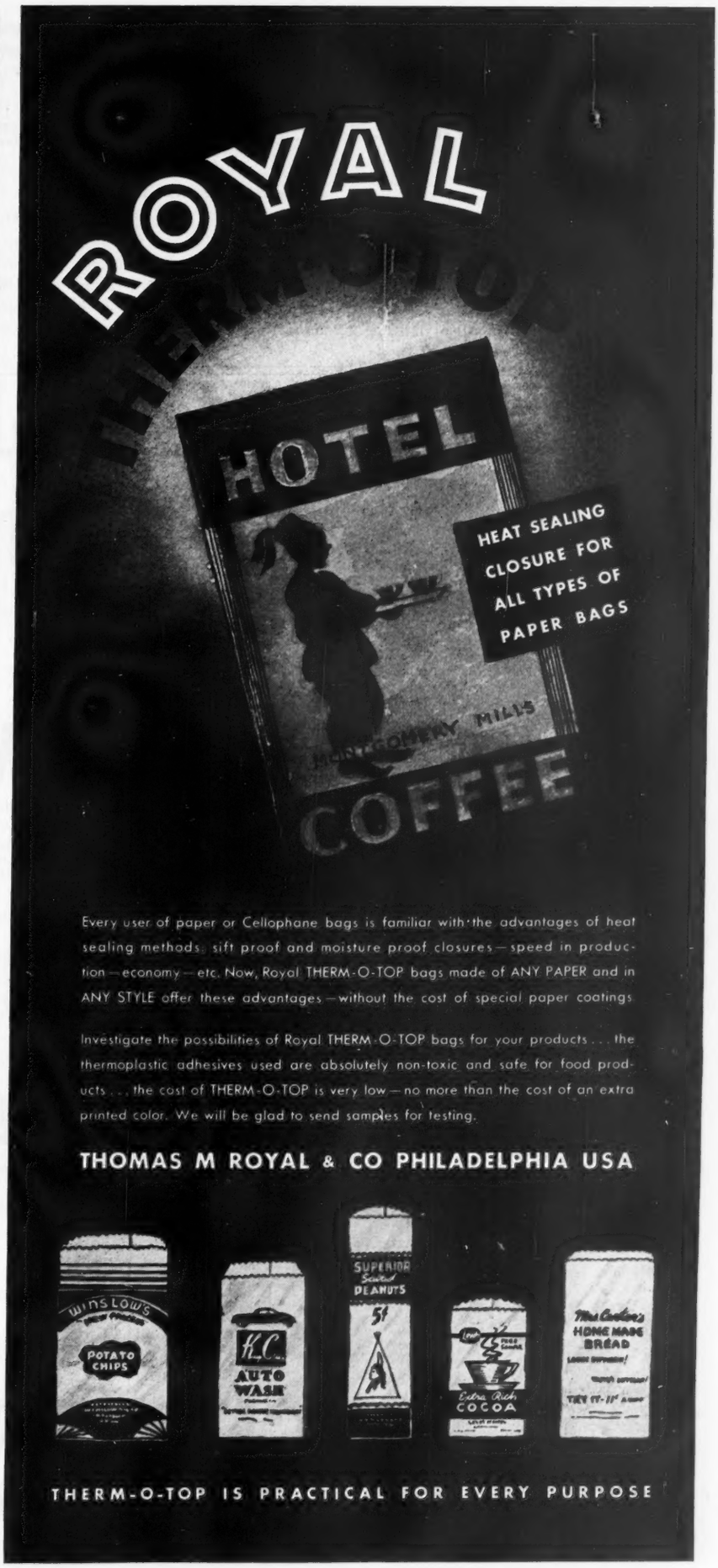
The analytical data show that the three main fractions in the ripe apple (starch:sugar, alcohol-insoluble matter excluding starch, and acid) all contribute to respiratory loss of carbon from stored apples. Within the investigated range, oxygen pressure has only a slight influence on the rate of sucrose hydrolysis, but carbon dioxide accelerates sucrose hydrolysis while retarding hydrolysis of the alcohol-insoluble fraction. Apparently a fructosan is present in the alcohol-soluble fraction. In the starch:sugar fraction there appears to be formation as well as loss of sugar. In particular, starch hydrolysis produces fructose during storage. The contrast in behavior at 33.8 and at 41 deg. F. is particularly sharp with respect to the alcohol-soluble fraction.

Digest from "Effect of Oxygen and Carbon Dioxide Tension in the Atmosphere on Chemical Change in Stored Apples," by F. Kidd and C. West, *New Phytologist* **38**, 105, 1939 (Published in England).

BEVERAGES

Plum Juice

JUICE from plums which have been blanched by the Cruess hot water method can be prepared with only 5 percent of added sugar if the ratio of blanching water to pulp in making the juice is 2:1. This ratio is better than using equal volumes of blanching water and pulp. The juice has an excellent plum flavor and aroma, with more body than when the water: pulp ratio is 1:1. Yield of juice is


ROYAL
THERM-O-TOP
HOTEL
HEAT SEALING CLOSURE FOR ALL TYPES OF PAPER BAGS
COFFEE
Every user of paper or Cellophane bags is familiar with the advantages of heat sealing methods, sift proof and moisture proof closures—speed in production—economy—etc. Now, Royal THERM-O-TOP bags made of ANY PAPER and in ANY STYLE offer these advantages—without the cost of special paper coatings
Investigate the possibilities of Royal THERM-O-TOP bags for your products . . . the thermoplastic adhesives used are absolutely non-toxic and safe for food products . . . the cost of THERM-O-TOP is very low—no more than the cost of an extra printed color. We will be glad to send samples for testing.
THOMAS M ROYAL & CO PHILADELPHIA USA
WINSLOW'S
POTATO CHIPS
K.C.
AUTO WASH
SUPERIOR
Salted
PEANUTS
5¢
Extra Rich
COCOA
HOME MADE
BREAD
THERM-O-TOP IS PRACTICAL FOR EVERY PURPOSE

decreased somewhat (to 63 percent), but this is very favorable in comparison with yields reported by the Glavkonserva cannery where the standard is 49 percent. Some tests were also made with sugar sirup instead of blanching water, but the results were less satisfactory. Juice made with 15 percent sirup in the ratio of 1:1 was not sweet enough, while juice made with sirup in the ratio of 2:1 was too thick. Plum juice having the best properties was obtained from pulp containing 5 percent sugar and 10.9 percent dry matter, with 0.55 percent acidity. The final sweetened juice contained 12.39 percent sugar and 17 percent dry matter, with 0.23 percent acidity.

Digest from "Making Plum Juice," by V. L. Flaumenbaum, *Konservnaya i Plodoovoshchnaya Promyshlennost* 10, No. 5, 15, 1939 (Published in Russia).

Beverage From Beets

ACCORDING to Canadian Patent 390,088 (granted July 23, 1940, to Henri Blackburn of Hull, Quebec), a palatable, inexpensive soft drink can be prepared by boiling chopped beets one hour in a sugar solution, draining off the liquid, adding water to the residue and boiling again for an hour. The finished beverage is obtained by combining the first and second liquid extracts, chilling the mixture, bottling the cold liquid under mild carbonating conditions, and pasteurizing.

CANNING

Copper in Greened Vegetables

OF NUMEROUS canned spinach samples only about one in eleven contained more copper than the (German) food law allows, but one in three were wrongly labeled with respect to copper content. Greening with copper sulphate is not the only source of copper in green vegetables, since canneries make some use of copper equipment. It is agreed among food experts that copper in canned foods (usually present in complex combination with proteins) presents no health hazard if the concentration does not exceed 100 p.p.m. But it is also agreed that greening with copper sulphate diminishes vitamin C potency. This effect might be insignificant in normal seasons when the population has access to an unrestricted balanced diet, but in winter, and throughout the year under wartime restrictions, no avoidable impairment of the food supply should be ignored. Canners cannot plead that greening is necessary for sales appeal, for vegetables which have not been artificially greened are successfully competing with the greened products. Natural greenness varies sufficiently with changes in soil, climate, ripeness and other factors to leave considerable leeway in the greenness of canned vegetables, and harmless vegetable dyes or permitted food colors are available if needed. Prohibition of copper sulphate greening is therefore recommended.

Digest from "Characteristics of Greening in Canned Vegetables," by E. Vollhase, *Zeitschrift für Untersuchung der Lebensmittel* 79, 153, 1940 (Published in Germany).

Citrus Fruit Juices

MANY SAMPLES of orange and lemon juice, produced in the Messina district, were characterized by physical tests and chemical analyses through the 1938-1939 crop season. Each sample was transported from field to laboratory with least possible delay, filtered to remove suspended solids and analyzed immediately.

Orange juice ranged from 1.0391 to 1.0458 in specific gravity, with 9.18 to 10.92 percent of dissolved solids. Total sugars (calculated as glucose) ranged from 5.06 to 7.75 percent. Ash content was fairly uniform (0.38

THE SIX STEPS TO...

CASTING is the second step. TRI-ALLOY metals are carefully weighed to assure sound castings. Coke fires are used exclusively, as nickel alloys will absorb gases and other impurities.

MOULDING is the first step in making TRIALLOY fittings. Special sands are used to assure smooth, pit-free castings. Non-warping metal patterns are used.

TUMBLING AND GRINDING is the third step. Gates and risers are cut off, castings are ground and put into revolving barrels with tumbling lacks to loosen sand

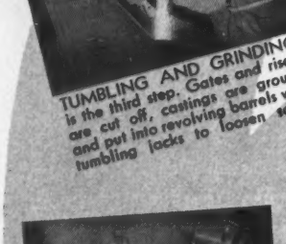
SATISFACTION

TRI-CLOVER TRIALLOY fittings are rapidly becoming known as the most successful of the nickel alloys for use in dairies. The pure white color and smooth, pit-free surfaces are not accidental, but are achieved through the most modern methods of manufacture. TRI-CLOVER TRIALLOY fittings last longer, stay brighter.

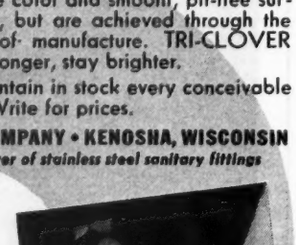
We manufacture and maintain in stock every conceivable type of sanitary fitting. Write for prices.

TRI-CLOVER MACHINE COMPANY • KENOSHA, WISCONSIN

World's largest manufacturer of stainless steel sanitary fittings



MACHINING is the fourth step. TRI-CLOVER engineers have designed hundreds of special tools to assure close precision work. Dimensions within .004 inch.



INSPECTION is the final step. TRI-CLOVER must meet standards set by dairy sanitarians, and are carefully inspected for size, soundness and number of threads.

POLISHING is the fifth step. Five different polishes, with heavy grinding wheels and canvas wheels, produce a finish free from bacteria-retaining rough portions.

TRI-CLOVER "THE Complete LINE"

TRI-CLOVER

SANITARY FITTINGS & PUMPS

TRIALLOY • PLATED BRONZE • STAINLESS STEEL

to 0.48 percent) but the alkalinity of the ash (calculated as potassium oxide) varied from 21.73 to 49.51 percent. Free acidity ranged from 1.65 to 2.41 percent.

Lemon juice had a slightly lower specific gravity range (1.0357 to 1.0427) but a characteristically higher free acidity (6.25 to 7.85 percent). Ash content was more variable than in orange juice (0.25 to 0.57 percent), while alkalinity of the ash covered about the same range (22.38 to 49.53 percent) as in orange juice. In keeping with the nature of lemon juice, the total sugar content was low (1.38 to 2.04 percent).

The amino acid content of citrus fruit juices is considered to be an important characteristic and the "amino acid number" is introduced in the analytical data. This number is defined as four times the volume of tenth-normal sodium carbonate solution used in titrating the liberated amino acids under specified conditions. In orange juice the amino acid number ranged from 10.13 to 20.30, and in lemon juice from 10.12 to 15.22.

Digest from "Physical and Chemical Properties of Citrus Fruit Juices," by E. Solarino, *Industria italiana delle conserve* 15, 4, 1940. (Published in Italy).

DAIRY PRODUCTS

Striking Ice Cream Mixes In the Pan

KNOWING THE COMPOSITION of the ice cream mix you want to make in a vacuum pan, you can figure out theoretically ahead of time at what Baumé the pan should be struck to get the correct concentration. The following densities can be used for a strike at 125 deg. F.: Milk solids not fat, 1.6129; sugar (sucrose), 1.6107; gelatin, 1.5384; milk fat, 0.8955; water, 0.98729. Multiply the percentage of each ingredient desired by the density given for it, add these "density factors" together, divide by 100 and multiply the result by the factor 0.949. This will give you the density of the final mix at 125 deg. Convert to Baumé degrees by the formula: Baumé equals 145 minus (145 ÷ density).

The method has been tested on a series of mixes of varying composition and is accurate to 0.2 deg. Bé. The temperature variation in reading the hydrometer is 0.2 deg. Bé. for each 5 deg. F. over the range 115 to 155 deg. Homogenization does not affect the results.

Digest from "A Method for Calculating the Baumé Reading of Condensed Ice Cream Mixes," by R. A. Larson and P. S. Lucas, *Journal of Dairy Science* 23, 229, 1940.

Propionic Acid Bacteria In Cheese

BACTERIA which form propionic acid were found in domestic Swiss, Iowa Swiss type, Cheddar and canned Cheddar cheese. In Swiss type cheese the propionic acid bacterial count was generally relatively high in cheese with the characteristic sweet flavor.

Trials with 18 strains of *Propionibacterium* revealed several strains which consistently gave desirable flavor, but none which consistently produced good eye formation. Sometimes the control cheese, receiving no added propionic acid culture, gave quite as good a flavor as with *Propionibacterium*. In these cases the natural propionic acid bacteria count was relatively high.

Adding 25 c.c. of propionic acid culture per 100 lb. of milk generally gave the desired sweet flavor. With 100 c.c. of added culture the cheese sometimes tasted too sweet. In most cases eye formation was best with only about 5 c.c. of added culture. The propionic acid organisms are not alone

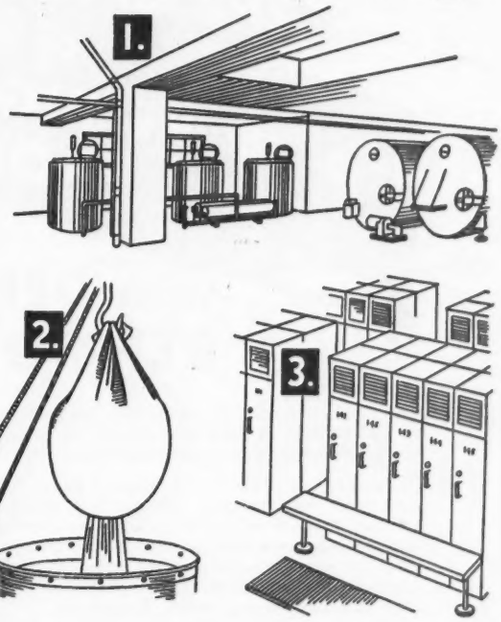
LET HTH PRODUCTS*

Preserve Purity
Prevent Spoilage

1. In thousands of dairy plants throughout the country, HTH Products are proving their effectiveness every day in controlling bacteria on equipment of every kind—receiving tanks, holding tanks, filters, coolers, pasteurizers, bottle-fillers, sanitary piping, etc.—and doing it quickly, positively and economically. Bottles, too, are safer when the final rinse solution is made from HTH Products.

2. Cheese bags used to present a difficult problem, but not since cheese plants discovered the effectiveness of HTH Products. Now they simply wash bags in hot water and an alkali cleanser, rinse in warm water, immerse in a 200 p.p.m. solution for a few minutes, then rinse out the remaining chlorine solution. Throughout the plant, too, they use HTH Products for controlling bacteria.

3. Modern food plants not only drill their employees constantly on the necessity of bacteria control in the plant, but maintain a rigid sanitary routine *everywhere* on the premises, including cafeterias, recreation rooms, locker rooms, toilets, etc. And they find HTH Products just as effective for deodorizing and disinfecting in such areas as for bacteria control in the plant itself.



Food and beverage plants find that HTH Products offer an effective means of combatting bacterial contamination that results in a real dollars and cents saving.

Let HTH Products show what they can do in *your* plant. These dependable chlorine sterilizers come to you in powder form, convenient to use.

Added to water, they make quick-acting germicidal hypochlorite solutions of the desired strengths for wiping, flushing or spraying all surfaces with which food or beverage products come in contact. HTH Products are so economical, they may be used freely. They do a thoroughly effective job.

Write today for full information about HTH Products and their use.

HTH PRODUCTS

THE MATHIESON ALKALI WORKS (INC.) 60 EAST 42ND STREET, NEW YORK, N. Y.

*HTH PRODUCTS (HTH, HTH-15 and LO-BAX) . . . DRY ICE . . . CARBONIC GAS . . . AMMONIA, ANHYDROUS and AQUA . . . CAUSTIC SODA . . . SODA ASH . . . BICARBONATE OF SODA . . . LIQUID CHLORINE . . . BLEACHING POWDER . . . PH-PLUS (FUSED ALKALI)

in favoring eye formation in Swiss type cheese; some specimens in which no propionic acid bacteria could be detected gave good eye formation.

Digest from "Bacteriological Studies on Swiss-Type Cheese From Pasteurized Milk," by Fred J. Bable, Doctoral Dissertation No. 510, Iowa State College, Ames, Iowa, 1939.

Alkalis for Cleaning Milk Equipment

HEAT-DEPOSITED MILK SOLIDS are readily removed from equipment by circulating suitable strengths of any of the common alkalis for 30 minutes at 130 deg. F. The minimum effective concentrations are: Trisodium phosphate, 0.3 percent; sodium metasilicate or sodium carbonate, 0.2 percent; caustic soda, 0.04 percent. Butterfat films are not removed by up to 2 percent caustic soda, but concentrations of 0.1 percent or more of sodium carbonate, metasilicate or trisodium phosphate are effective. Use of 1.8 percent caustic soda with 0.2 percent sodium metasilicate or trisodium phosphate is more satisfactory than caustic plus sodium carbonate, the metasilicate combination being the better emulsifier. An unnamed surface-active organic detergent was effective at 0.2 percent without producing emulsification, also if 0.1 or 0.2 percent was combined with 2 percent caustic soda.

Digest from "Study of Dairy Cleaning Problems. II. Effectiveness of Alkalis in Removing Heat-deposited Milk Solids and Butterfat Films," by J. J. Johnson and C. T. Roland, *Journal of Dairy Science* **23**, 463, 1940.

Salt and Butter Quality

THERE is no direct, constant relation from which the threshold of salty flavor in butter can be predicted after determining the salt content. The natural salt content of butter is so low that any sample with over 0.1 percent sodium chloride can be considered as salted butter. With 0.3 percent or more it comes under the legal definition of salted butter in Germany and must not contain over 16 percent moisture (as against 18 percent permitted in unsalted butter). In 104 butter samples having no salty taste, the sodium chloride content ranged from 0.12 to 1.64 percent. In 26 salty-tasting samples the range was from 0.64 to 2.93 percent, with eight samples below 1 percent and six samples above 1.5 percent. Salt has sometimes been blamed for fishy flavor, poor keeping quality and other defects in butter, but these tests have given no evidence that salt is responsible for faults in quality.

Digest from "Determining Sodium Chloride and Its Influence on Quality in Butter," by A. Burr, *Chemiker-Zeitung* **64**, 134, 1940 (Published in Germany).

Condensing Milk Prevents Oxidized Flavor

CONCENTRATING pasteurized milk in stainless steel or glass equipment to a 2:1 ratio prevents the development of oxidized flavor, even when 3 p.p.m. of copper is added. This is true when the milk, either concentrated or diluted back to 4 percent fat, is held up to three days at 40 deg. F. Even air bubbled through does not produce any off flavor. This preventive action seems to be due to the solids not fat, as milk remade from cream and concentrated milk does not become tallowy. Concentrating the milk alters its curd tension and also lowers the ascorbic acid (vitamin C) content. There seems to be no connection between the destruction of ascorbic acid by oxidation and the formation of oxidized flavor. The delay in development of this off flavor may be due to the antioxidizing action of traces of aminoacids formed by a slight breakdown of the milk proteins during condensing.

Digest from "Effect of Condensing on the Development of Oxidized Flavor," by W. J. Corbett and P. H. Tracy, *Journal of Dairy Science* **23**, 209, 1940.

Safeguard
the CASH VALUE
of Your
REFRIGERATED
PRODUCTS
with DEPENDABLE
REFRIGERATION
The most vital point to consider when buying *any* refrigeration equipment is: DEPENDABLE PERFORMANCE. It is your only real safeguard against the costly losses that result from mechanical breakdowns.
Whether your problem be display cases, walk-in coolers or product storage, your investment in refrigeration deserves your serious attention. To get *full* value from this investment you should not only select a machine of the proper type and size for your requirements — but equally as important, one that is made by a reliable company that has had long, varied experience in the commercial refrigeration business. For many years Lipman machines have paid for themselves through economy of operation and in smaller losses from spoilage and shrinkage.
Let us tell you in detail, just why LIPMAN REFRIGERATION MACHINES are exceptionally dependable. For complete data, Write:
GENERAL REFRIGERATION DIVISION
Yates-American Machine Company
Department F1-940
Beloit, Wisconsin
101
Lipman
CONQUERS HEAT
Lipman
AUTOMATIC REFRIGERATION

Milk Films on Equipment

ORDINARY MILK flowing through a stainless steel internal tubular heater deposits milk solids on the surface of the tubes of a cheesey consistency and in the form of small craters. The more the temperature difference between the milk and the heating medium, the greater is the deposit. After a relatively short period of operation it may take twice as long to heat the same volume of milk. This deposit analyses over 50 percent fat and 35 percent protein. If the milk is thoroughly deaerated before heating, this deposit does not form. Below this deposit is another, which is also formed by deaerated milk. This is in the form of an extremely thin bluish discoloration and may be due to insoluble salts precipitated by heat. It is hard to remove, scouring being necessary. If not removed, it eventually forms the basis of milkstone.

Digest from "Study of Dairy Cleaning Problems. I. Films and Deposits on Hot-milk Equipment," by J. J. Johnson and C. T. Roland, *Journal of Dairy Science* **23**, 457, 1940.

FATS & OILS

Fats and Oils Analysis Methods Recommended

THOSE who have occasion to work with commercial fats and oils will be interested in studying proposed methods of analysis recommended by the American Chemical Society committee on analysis of commercial fats and oils. These methods are for titer, the modified Gardner break test, the detection of tristearin in lard, the Villavecchia test for sesame oil, calculations of the hydroxyl value and the smoke, flash and fire points. The report of the committee will be found in the Analytical Edition of *Industrial and Engineering Chemistry*, July, 1940, pages 379–384. It is too complex to abstract in these pages.

MEATS

Fat-meat Deterioration In Storage

COLD STORAGE TESTS with beef quarters and pig halves held from four to eighteen months at −6, 5 and 16 deg. F. showed that the fat turns rancid within four months at 16 deg. F. In twelve months at −6 and at 5 deg. F. the only noticeable difference was better aroma in the colder meat. Quality ratings based on tests after cooking agreed with chemical tests.

Both air and light are harmful to the fat in stored meat. After 18 months in a dark storage room, lighted only when the door was opened, there was definite chemical evidence of fat spoilage due to these brief exposures to light. Meat stored at 16 deg. F. in an atmosphere of carbon dioxide rated as high as meat stored in air at 5 deg. F.

In the best warehouse practice, meat rooms are now kept dark and persons entering them must use a flashlight or a lamp giving light of a wave length (color) not harmful to fats. Storage in carbon dioxide, though definitely helpful to quality, is not yet recommended because tests with other gases are in progress.

Digest from "Durability of Beef and Pork Fats at Low Temperatures," by F. Kiermeier, *Zeitschrift des Vereins deutscher Ingenieure* **84**, 74, 1940 (Published in Germany).

MISCELLANEOUS

Vitamin C in Tea

FRESH TEA LEAVES are rich in ascorbic acid (vitamin C), but in preparing black tea all the vitamin is lost. There are also serious vitamin losses in preparing green tea, but by proper control of the process the loss can be minimized so that the final product retains 70 to 80 percent of the original ascorbic acid content. The principal precaution is to make sure that the enzyme (ascorbic acid oxidase) which destroys the vitamin is itself destroyed by a rapid but effective heat treatment early in the preparation process. Ascorbic acid has certain functions in the respiration of tea leaves and also influences the fermentation process in preparing the dried leaves.

Digest from "Recent Studies of Vitamin C in Tea Leaves," by W. B. Deigs, *Chemisch Weekblad* **37**, 228, 1940 (Published in Holland).

Preserving Coffee Aroma By Antioxidants

BECAUSE the aroma principles contained in coffee are sensitive to oxidation by atmospheric oxygen, the keeping quality of coffee can be improved by adding an antioxidant. As the invention is disclosed in Canadian Patent 389,192 (granted June 4, 1940, to W. R. Johnston, Quick Landis, H. C. Gore and C. N. Grey and assigned to Standard Brands, Inc., New York), an antioxidant is selected which does not materially influence the flavor and aroma of beverage prepared from the treated coffee.

Numerous effective antioxidants are available for the purpose. Among the suitable compounds are polyhydric phenols such as hydroquinone, resorcinol and orcinol; amino acids such as glycine or asparagine; and aromatic bases such as diphenylguanidine or diphenylamine. The treatment by which coffee is protected from oxidation of its aromatic principles comprises immersing green coffee beans in an aqueous solution of the selected antioxidant, roasting the beans, then freezing them at about −112 deg. F. and grinding the beans while cold. The ground coffee is then packed under a high vacuum.

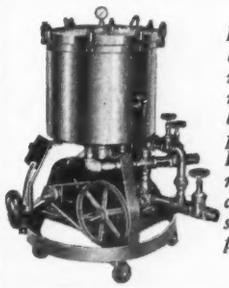
Pectin From Chicory Root

CHICORY ROOT is potentially a valuable source of commercial pectin. The root is used to some extent in the fermentation industry for making alcohol, and the residue from this process offers a particularly inexpensive raw material for pectin recovery.

Chicory is comparatively rich in pectin, containing slightly more than 10 percent, calculated on the dry-matter content of the root. Pressed juice from the raw root contains about 42 percent pectin. Analysis of chicory pectin shows that the hydropectin fraction contains 73.7 percent of calcium-magnesium pectate and 26.3 percent of a fraction soluble in aqueous (70 per-

DOUGHNUT OIL FILTER

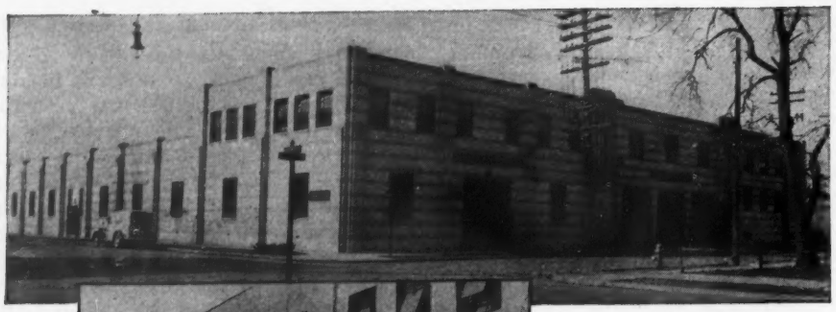
Eliminate the dirt and you save the oil. Many enthusiastic users say—"We are doubling the life of our oil with the handy SPARKLER filter."



Filters 50 gallon batch in 12 minutes, removes all carbon and suspended matter. Is cleaned in 10 minutes. Sturdy, compact construction. Inexpensive.

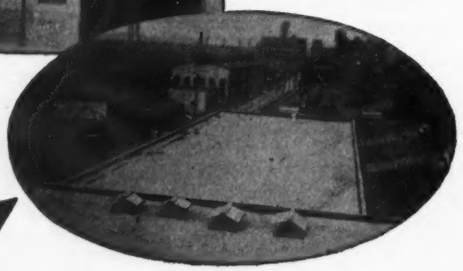
Also many other models for filtering syrups, extracts, cider, vinegar, liquor, etc. Write for special bulletins and prices.

SPARKLER MFG. CO.
1210 Webster Avenue, Chicago



Kraft Pittsburgh Distributing Branch

Kraft Detroit Distributing Branch



Carey

BUILT-UP ROOFS for Kraft Cheese Company

THE famous products of the Kraft Cheese Company, stored in its modern Pittsburgh and Detroit branches, are protected by CAREY Built-Up Roofs.

These buildings are covered with CAREY Bonded Roofs, which eliminate roof worries over a long period of years and reduce overhead to the minimum.

Whatever your roofing problems, CAREY can help you solve them. Our book, "Master Specifications for Built-Up Roofs," will be mailed upon request. Address Dept. 32.

INDUSTRIAL BUILDING PRODUCTS OF
ASPHALT — ASBESTOS — MAGNESIA

Roofing ... Siding ... Flooring ... Insulations ... Roof Coatings and Cements
Waterproofing Materials ... Expansion Joint ... Asbestos Paper and Millboard

THE PHILIP CAREY COMPANY · Lockland, Cincinnati, Ohio
Dependable Products Since 18[illegible]
BRANCHES IN PRINCIPAL CITIES

cent) alcohol. This alcohol-soluble fraction is mostly composed of pentoses (about 55 percent arabinose and 42 percent galactose). Chicory hydropectin is closely similar to beet hydropectin in composition.

The pectic acid fraction is about two-thirds galacturonic acid but it also contains a trace of acteic acid and about 5 percent of methyl alcohol. No ketoses, methylpentoses or xylose could be detected in the pectic acid fraction, but arabinose was present (16.5 percent).

Digest from "Pectin Substances in Chicory," by L. N. Aizenberg, *Journal of Applied Chemistry (USSR)* **13**, 275, 1940 (Published in Russia).

Quality of Vegetables

FLAVOR, a leading criterion of quality in vegetables, depends not only on the absolute content of flavor principles but also on their relative proportions, as in vegetables which contain both sugars and acids. Other constituents which require special attention are the bitter principles, aromatics and the like.

In six varieties of tomatoes the acid: sugar ratio ranged from 15.7 to 30 (average 22.7) when raised in a hothouse, and from 11.8 to 22 (average 15.6) when raised outdoors. Vitamin C content ranged from 11.9 to 19.3 (average 15.4) in hothouse tomatoes and from 14.7 to 41.3 (average 25.8) in outdoor tomatoes.

Again, the sugar content, starch content and sugar:starch ratio have been measured at three stages of ripeness for three varieties of garden peas. The data thus obtained are useful in estimating quality of peas for marketing or canning. In *Thomas Lackstom* peas and sugar content dropped from 37.9 per cent in the early stage to 28.6 per cent (calculated on dry matter) in the late stage of ripeness. Meanwhile the starch content rose from 0.8 to 1.2 per cent. *Early Green* peas were poorer in sugar (falling from 24.7 to 11.5 per cent) and richer in starch (rising from 2.3 to 7.5 per cent).

In cabbage, Brussels sprouts and Savoy cabbage, the vitamin C content varies with the age of the plant, rising to a maximum at about the time the leaves begin to curl, or somewhat later when the head is forming, then falling off sharply as the head matures. There is a relation between enzyme activity and vitamin C content in cabbage. This is reflected in the peroxidase and ascorbinase activity, which show a certain parallelism with vitamin C content.

Digest from "Biochemical Indexes of Quality in Vegetables," by B. A. Rubin, *Bulletin de l'Academie des Sciences de l'URSS* **936**, 1939 (Published in Russia).

Books

Bacteria, Yeasts and Molds

INDUSTRIAL MICROBIOLOGY. By Samuel Cate Prescott and Cecil Gordon Dunn. Published by McGraw-Hill Book Co., 330 West 42d St., New York, N. Y. 1940. 541 pages; 6½x9¼ in.; cloth. Price, $5.

Dealing specifically with the science of microbiology as it is put to work in industrial processes, this book is of particular interest to food technologists. But to properly understand the subject matter, the reader needs a somewhat extensive training in biology and general bacteriology, at least the fundamentals of organic chemistry and biochemistry.

The work expounds the fundamentals of the utilization of yeasts, bacteria and molds for the production of commercial products. It takes up the nature of the organisms, their cultivation, conditions of fermentation, end-products and the biochemistry of the fermentation. Recent advances in the fermentation industries and in research are discussed.

Of particular interest to the food technologist are the chapters on yeasts; brewing; wine; yeast manufacture, vitamins and uses; bacteria; the production of lactic acid by fermentation; sauerkraut; pickles; some lactic acid bacteria and some fermented milk products; cheese; molds; production of lactic acid by molds; and mold enzyme preparations. Also of particular interest is Appendix B, which covers the treatment and disposal of industrial microbiological wastes.

Research on Bacon

CANADIAN WILTSHIRE BACON. By W. H. Cook, N. E. Gibbons, C. A. Winkler, W. H. White, A. E. Chadderton and N. E. Gibbons. Reprinted from the *Canadian Journal of Research* by National Research Council of Canada, Ottawa, Canada. 1940. In six parts, 5 to 13 pages in each; 7x10 in.; paper. Price, 25 cents for each part, except Part IV, which is 10 cents.

The information in this series of six reports was obtained by bacterial, chemical and physical measurements on bacon and pickle in 22 packing plants. The purpose was to determine the over-all variation occurring in practice, the general sources of the variation, and the specific effect of certain curing practices.

Report No. I outlines the investigation and method; No. II pertains to the chloride, nitrate and nitrite content of bacon and pickle; No. III, pH oxidation-reduction potential and miscellaneous measurements on bacon and pickle; No. IV, correlation between constituents and properties of bacon; No. V, quantitative bacteriological studies on curing pickles; No. VI, quantitative bacteriological studies on the product.

Data on Waste Disposal

METHODS OF TREATING CANNERY WASTES. Bulletin No. 28-L. By L. F. Warrick, F. J. McKee, H. E. Wirth and N. H. Sanborn. Published by National Canners Association Research Laboratory, Washington, D. C., 1939. 91 pages; 6x9 in.; paper. Free; distribution restricted.

Detailed accounts of chemical and biological investigations on the treatment of wastes from pea, beet, tomato, carrot and corn canning operations are contained in this report. The work reported under biological experiments represents a comprehensive accumulation of data on experimental high-rate trickling-filter treatment. Important under the chemical precipitation studies was the examination of the coagulating properties of 12 different precipitants.

Information About Sugar

PRODUCTS OF CORN IN THE DIET. Published by Corn Industries Research Foundation, 270 Broadway, New York, N. Y., 1939. 20 pages; 8¾x5¾ in.; paper. Free.

Here are published excerpts from the public hearings in Washington last spring on the nature and uses of sugars and on standards of identity and quality of canned peaches, apricots, pears and cherries under the provisions of the new Federal Food and Drug Law.

The publication makes concise, informative reading of interest to all food manufacturers using sugar in their products.

Hydroponics by the Master

THE COMPLETE GUIDE TO SOILLESS GARDENING. By Dr. William F. Gericke. Published by Prentice-Hall, Inc., 70 Fifth Ave., New York, N. Y. 1940. 285 pages; 6½x9¼ in.; cloth. Price, $2.75.

Various books have been written about "hydroponics," the science of chemical culture of plants. But this is the first by the man generally credited with giving birth to that science.

Dr. Gericke covers the subject thoroughly and in a practical manner. He describes the apparatus, gives the nutrient formulas and tells what kind of water to use, how to plant and what physical conditions to maintain where the plants are growing. He also devotes sections of his book to particular plants, such as tomatoes and other vine crops, potatoes, root vegetables, leaf vegetables, seed vegetables, perennial vegetables and berries, field crops and certain flowers.

For those in the food industry who desire to study or experiment with hydroponics as a new method of producing food and food raw materials, this book will be valuable.

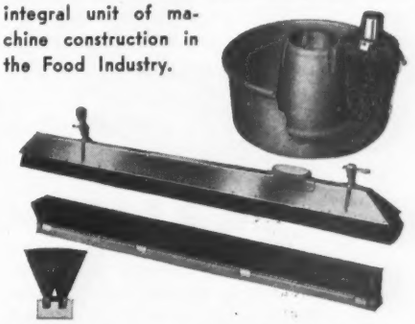
Locker Plant Operation

FREEZING AND STORAGE OF FOODS IN FREEZING CABINETS AND LOCKER PLANTS. By D. K. Tressler and C. W. DuBois. Published by New York State Agricultural Experiment Station, Geneva, N. Y., as Bulletin No. 690. 1940. 59 pages; 5¾x8¾; paper. Free.

Locker plant operations are discussed in a practical manner. The layout and equipment of the plants are covered, as are other factors such as temperatures, packaging materials and preparation of the products. A table gives the varieties of vegetables satisfactory for freezing, useful also to operators of food freezing plants.

Fuller **STEELGRIPT BRUSHES**

FOOD machinery manufacturers recognize the superiority of STEELGRIPT enduring brush construction. Greater density of bristles, held securely in rigid metal back, gives longer life and dependable performance. STEELGRIPT Brushes have been adopted as an integral unit of machine construction in the Food Industry.



BAKERIES—Oven Conveyor Brushes, Mixing Machinery, Pan Cleaning
FLOUR MILLS—Grinding, Purifiers, Bran Dusters
DAIRIES and BOTTLERS—Cylinder Brushes, Tube, Regenerator, etc.
MEAT PACKING—Ham Containers, Casing Brushes
CANDY—Air and Bed Brushes, Cylinder Brushes
FRUIT GRADING and BRUSHING—Canning Machinery, Labeling, Wrapping Machinery, etc.

For further information write

The FULLER BRUSH Company
INDUSTRIAL DIVISION — DEPT. BC
3592 MAIN STREET — HARTFORD, CONN

Patents

Coffee Granules and Fines Blended in an Elongated Cylinder Equipped With a Spiral Conveyor and a Non-rotatable Disk Baffle to Obtain Uniformity of Mixture—Eugene G. Berry, Albert J. Hazle, Jr., and William M. Williams to B. F. Gump Co., Chicago, Ill. No. 2,202,891. June 4, 1940.

Coffee Ground on a Mill Equipped With Mixing Device to Give Uniform Distribution of Granular and Chaff or Fines Particles—William M. Williams and Eugene G. Berry, to B. F. Gump Co., Chicago, Ill. No. 2,202,936. June 4, 1940.

Beef Carcass Made to Retail Freshly Killed Appearance by Covering With Cloth While Still Warm to Absorb Blood on Skinned Surface, Kept Covered Until Partially Chilled, and Re-covered With Second Cloth Moistened with Brine Following Removal of First Cloth and Branding of Carcass—Andrew S. Hartanov, to Industrial Patents Corp., Chicago, Ill. No. 2,202,951. June 4, 1940.

Lettuce Given a Crushed-ice Water Packing in Cylindrical Watertight Container Made From Material of High Thermal Conductivity—Ellis H. Spiegl, Salinas, Calif. No. 2,203,033. June 4, 1940.

Liquids in Containers Given Pasteurizing Treatment While Passing Through Heat-Treating Zone on Travelling Conveyor—John R. Gruetter, to Liquid Carbonic Corp., Chicago, Ill. No. 2,203,141. June 4, 1940.

Lecithin Prepared in Emulsion Form With Urea as Emulsifying Agent—Richard Feibelmann, to Aktivin Corp., New York, N. Y. No. 2,203,295. June 4, 1940.

Meat Cuts Freed From Connective Tissue With Conversion Into Kneadable Mass for Rolling Into Sheet Form Suitable for Cooking—Henry H. Yerk, Chicago, Ill. No. 2,203,318. June 4, 1940.

Dextrose Made From Starch by Using a Converting Acid at Approximately Atmospheric Pressure—Charles J. Copland, North Kansas City, Mo., to Corn Products Refining Co., New York, N. Y. No. 2,203,324. June 4, 1940.

Dextrose Made From Starch by Using a Hydrolyzing Acid at Pressures Substantially Above Atmospheric and a Second Acid Treatment in the Finishing Pan to Depolymerize Polysaccharides—Sidney Mark Cantor, Riverside, Ill., to Corn Products Refining Co., New York, N. Y. No. 2,203,325. June 4, 1940.

Frozen Meat Leached and Thawed by Recirculating Brine Solution and Adding Heated Fresh Brine to Keep Bath at Uniform Thawing Temperature—William W. Bowers, to Wilson & Co., Inc., Chicago, Ill. No. 2,203,454. June 4, 1940.

Meat Masses Slit by Rotary Knives Adjusted to Operate on the Meat With a Draw Cut—Joseph P. Spang, Quincy, Mass., to Cube Steak Machine Co., Inc., Boston, Mass. No. 2,203,603. June 4, 1940.

Pie Filling and the Like Containing Thickening Constituent Given a Finish Cook Under Partial Vacuum After Cutting Off of Heat With Degree of Vacuum Increased to Continue Boiling and Rapid Agitation With Reduction in Pressure and Lowering of Temperature—John C. Smaltz, New York, N. Y., and Claude J. Convert, Glen Rock, N. J., to Vacuum Candy Machinery Co., New York, N. Y. No. 2,203,638. June 4, 1940.

Thickened Salad Dressing Emulsion Made by Adding a Plastic Solid Fat Constituent to an Oil-in-water Emulsion Type of Salad Dressing Containing a Gelatinized Emulsifying Agent—Albert Musher, New York, N. Y., to Musher Corp., Elizabeth, N. J. No. 2,203,643. June 4, 1940.

UNIFORM . . .
. . CONTROLLED .
. . . FEEDING

Draver Percentage, Conveyor and Wing Type Feeders

Positive, accurate capacity control of dry, powdered, or granular materials can be obtained with dependable Draver Conveyor and Wing Type Feeders. More than 100 models and sizes, from which to choose for your specific feeding requirements. Capacity ranges from as little as several ounces per minute, up to thousands of pounds per hour. Complete information and catalogs on request. Write to

B. F. Gump Co
Engineers and Manufacturers
454 S. CLINTON ST., CHICAGO, ILL.

Bread Baked in Oven Equipped to Discharge Steam From Baking Chamber Into Flue to Accelerate the Flue Draft—Edward M. Meacham, Elyria, Ohio, to American Stove Co., St. Louis, Mo. No. 2,204,045. June 11, 1940.

Vegetable Oils Treated With Small Quantity of Hydrogen Peroxide Solution to Precipitate Phosphatide Content Without Destructive Effect—Benjamin H. Thurman, Bronxville, N. Y., to Refining, Inc., Reno, Nevada. No. 2,204,109. June 11, 1940.

Animal Livers Freed From Excess Blood, Put in Shaping Forms and Covered With Uniform Thin Blood Film Preparatory to Freezing—Veri A. Wise, Stanley B. Duffies, Grover R. Henney and Carl L. Lohner, to Industrial Patents Corp., Chicago, Ill. No. 2,204,459. June 11, 1940.

Frozen Confections Made by Forming in Refrigerated Molds Into Which are Suspended Ends of Confection-supporting Rods, Removing Molds and Forcing Confections off Rods in One Operation—James E. Hogue, Hot Springs, Ark., to Joe Lowe, Nos. 2,204,495 and 2,204,496. June 11, 1940.

Foods Stabilized Against Oxidative Action by Addition of Mascerated Pulp of a Non-fatty Unripe Fruit of an Edible Dicotyledon Plant—Carleton Ellis, Montclair, and Frederick Dannerth, East Orange, N. J., to Ellis Laboratories, Montclair, N. J. No. 2,204,728. June 18, 1940.

Partially Rancid Edible Fats Freed From Rancidity by Treatment With Finely Divided Mass of An Edible Flowering Plant at a Temperature Not to Exceed 100 Deg. C. With Subsequent Separation of the Fat From the Flowering Plant Material—Carleton Ellis, Montclair, and Frederick Dannerth, East Orange, N. J., to Ellis Laboratories, Inc., Montclair, N. J. No. 2,204,729. June 18, 1940.

Heated Gas Injected Into Head Space of Carbonated-beverage Containers for Removal of Air—David B. Stone to Crown Cork & Seal Co., Inc., Baltimore, Md. No. 2,204,833. June 18, 1940.

Artichokes Trimmed by Mechanical Means—Louis Dotta, San Jose, Calif., to Pratt-Low Preserving Co., Santa Clara, Calif. No. 2,204,846. June 18, 1940.

Fluid Pipe Lines Cleaned by Forcing Chemical Detergent Through Line With a Pressure Pump—Le Roy D. Lowry, Detroit, Mich. No. 2,204,900. June 18, 1940.

Citrus Fruits Freed From Juice by Bucket-wheel Extractor—William E. Clark, Dundalk, Md. No. 2,205,059. June 18, 1940.

Sandwich Sticks Made to Consist of an Extruded Tube of Farinaceous Material Having a Core or Filling of a Different Food Material and Given a Superficial Drying Preliminary to Canning—Frederick Hammond, Charleston, W. Va. No. 2,205,094. June 18, 1940.

Sugar Put Into a Granular or Pellet Form Consisting of Crystal Agglomerates—John W. Schegel, East Orange, N. J., and Louis Lang, New York, N. Y., to The National Sugar Refining Co. of New Jersey. No. 2,205,177. June 18, 1940.

Sticky Candy Wrapped With a Transparent Sheet Material Having a Moisture-proof Coating—Theodore Rudolph Latour, Kenmore, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del. No. 2,205,210. June 18, 1940.

Cookies Given Icing Coating by Mechanical Means Having Conveyor Belt Passing Through Coating Material—George Studebaker, one-half to Zion Industries, Inc., Zion, Ill. No. 2,205,317. June 18, 1940.

Winter Salad Oil Made From Cottonseed Oil by Chilling Under Controlled Conditions for Removal of Stearine Content—Eddy W. Eckey, Wyoming, and Robert G. Folzenlogen, Lockland, Ohio, to Procter & Gamble Co., Cincinnati, Ohio. No. 2,205,381. June 25, 1940.

Eggs in Shell Cleaned Mechanically by Action of Steel Wool Buffing Disk.—Russel C. Storer, Cleveland, Ohio. No. 2,205,606. June 25, 1940.

Sugarcane Mill Constructed to Operate Under Hydraulic Pressure—Eugene A. Schwarz, Snyder, and Otto Faber, Kenmore, N. Y., to George L. Squier Mfg. Co., Buffalo, N. Y. No. 2,205,632. June 25, 1940.

Vitamin A Concentrate Separated From Animal Oils and Fats Containing the Vitamin in Ester Form by Vacuum Distillation at a Pressure Below 0.1 Mm.—Kenneth C. D. Hickman, to Distillation Products Inc., Rochester, N. Y. No. 2,205,925. June 25, 1940.

Beer and Ale Stabilized in Respect to Light, Heat, and Oxidation Reactions by Addition of a Hydrosulphurous Acid Salt.—Leo Wallerstein, New York, N. Y. No. 2,206,066. July 2, 1940.

Monoglyceride and Diglyceride Fats Made by Heating Glycerides Found Normally in Fats and Fatty Oils With Glycerine in a Stream of Inert Gas in the Presence of a Catalyst of Alcoholates of Alkali Metals and Soaps of Alkali Metals.—August Edeler, Cincinnati, and Albert S. Richardson, Wyoming, Ohio, to Procter & Gamble Co., Cincinnati, Ohio. Nos. 2,206,167 and 2,206,168. July 2, 1940.

Sugar Crystals Uniformly Mixed With Mother Liquor by Mechanical Means Before Being Conveyed to Centrifugals.—Eugene Roberts, Hastings, N. Y., to the Western States Machine Co., Salt Lake City, Utah. No. 2,206,237. July 2, 1940.

Frankfurters Tenderized by Fine Slitting of Skin Into a Plurality of Small Areas—William N. Justice, Baltimore, Md. No. 2,206,256. July 2, 1940.

Cooky-cutting machine—Frank Charles Werner, Grand Rapids, Mich. No. 2,206,312. July 2, 1940.

Sandwich-cooky Machine—Frank Charles Werner, Grand Rapids, Mich. No. 2,206,313. July 2, 1940.

Juice From Plural Stages of Sugarcane Crushing Collected Separately to Permit Rise of Foam and Settling of Scum; Foam From Each Volume of Juice Returned to First Crushing Stage and Scum From Each Volume of Juice Added to Succeeding Crushing Stage—Armando S. Villasuso, Ingenio Concepcion, Tucuman, Argentina. No. 2,206,341. July 2, 1940.

Stable Casein Solutions Made From Casein Obtained in Granule Form From Skimmed Milk—Theodor Koch, Oosterbeek, Netherlands, to American Enka Corp., Enka, N. C. No. 2,206,357. July 2, 1940.

Milk Wastes

(*Continued from page 48*)

being accomplished by compressed air forced through pipe grid units submerged about 8 ft. and arranged along the line of flow in long concrete tanks. Although no definite measurements of air used in the activated sludge process were available, it was roughly estimated from the capacity of the air compressor and average flow that about 10 cu.ft. of air per gallon of wastes was being applied. The wastes after aeration flow into a final settling tank, from which a portion of the solids that concentrate at the bottom are pumped back to mix with the wastes entering the aeration tanks. The clarified wastes that overflow into the effluent troughs were found to have an average B.O.D. of 9 p.p.m.

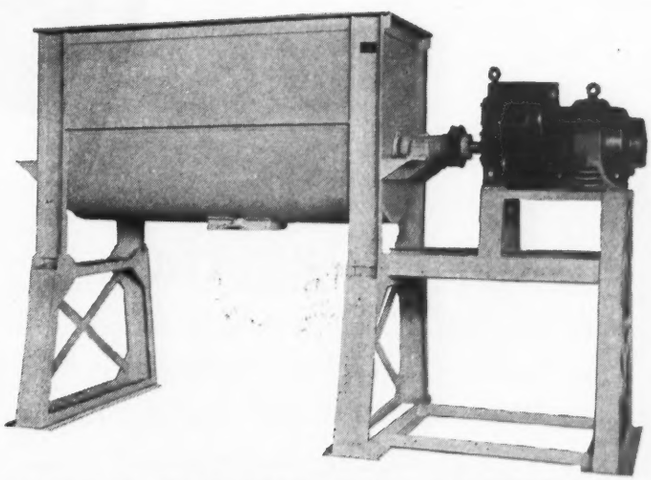
In the trickling filter system studied, a waste having a strength of from 1,000 to 1,300 p.p.m. B.O.D. is passed through a bar screen, a holding and flow equalizing tank, and crushed rock filter, followed by a clarifier or final settling tank. The retention of the wastes in the holding tank results in production of acidity by fermentation, with as much as 30 percent reduction in solids and 50 percent in B.O.D. The sludge is periodically removed from the tank under contract with a local farmer. By diluting the wastes with cooling water and recirculating a part of the filter effluent, the B.O.D. of the filter influent is kept as low as possible, or around 100 p.p.m. The final effluent discharged into a dry ditch has a residual B.O.D. averaging about 6.5 p.p.m. and suspended solids of 14 p.p.m. From a study of analytical and cost data this was determined to be the most satisfactory treatment.

In providing a milk waste treatment system it is essential first to determine the losses in milk solids and take steps in the milk plant to reduce these losses to the very minimum. Good plant management in avoiding spillage and needless waste of milk, including improved methods of milk can dumping, has reduced the organic content of wastes requiring treatment as much as 50 percent. The blowing out of cooling coils before washing operations, care in evaporator operation, avoidance of wastage of milk solids around dryer equipment, and many other such procedures will reduce materially expenditures for waste disposal systems.

Strong wastes, such as whey, should be utilized or disposed of entirely apart from waste treatment. The trend is toward increasing use of whey and other wastes containing relatively high percentages of milk solids in the manufacture of byproducts. Procedures have been established for removing fat as whey butter, and the application of lime, boiling and fermentation has produced calcium lactate. Evaporation has produced a residue marketable as poultry food. Casein whey has been boiled with hydrochloric acid to precipitate high protein poultry food. Research is continually being directed toward reclaiming protein and carbohydrates in whey. Even though the lactose, or milk sugar, market has been limited, the manufacture of sodium lactate appears promising for use in automobile radiators in place of glycerine, and for fabric printing. While obstacles in taking care of whey have been the existence of a large number of small cheese factories and costs of equipment and processing, the trend is toward establishing central plants to which the whey can be delivered from a number of surrounding factories. Utilization is expected to be the answer to the whey problem, lending further support to the adage, "from the waste of today will come the profits of tomorrow."

In design of the treatment system for the milk washings, screening facilities should be provided to remove large floating solids, followed by trickling filters provided with suitable dosing equipment to obtain reasonable uniform distribution over the entire surface of rock or filter media. Experience would indicate that the filter media should be fairly coarse (2 to 4 in. rock) to prevent clogging and permit adequate filter ventilation. The underdrains should be adequate in capacity to allow free circulation of air as well as to carry off the filter effluent. Recirculation should be provided for through some arrangement. A settling tank for the filter effluent is necessary to remove the solids that wash off the filter media. While a considerable amount of these solids will settle in 30 minutes, as much as two hours' detention is desirable.

As regards the size of the filter, the Wisconsin Board of Health has recommended 80 cu. ft. of crushed rock per pound of B.O.D. applied per day with from 6 to 8 ft. of filter depth. This contemplates a single passage of wastes through the unit. There is experience to show that higher unit capacities are feasible with recirculation, two-stage filtration, and other provisions, but these items need careful consideration in connection with each individual problem.



WE GET THINGS MIXED UP

. . . . . for other people

And we've been doing it for over 40 years . . . designing and building such a complete line of mixers that you would have difficulty naming a material we have not coped with—everything from feathers to fertilizer, from pepper to plastics — each job getting the full cooperation of engineers who know the problems involved.

If you want to look over the Robinson machines that mix faster, better, cheaper, drop us a line today requesting Bulletin No. 32-E.

ROBINSON MANUFACTURING CO.
71 Painter St., MUNCY, PA.

SOLUBILITY OF VANILLIN IN ALCOHOL-WATER MIXTURES

PER CENT ALCOHOL BY VOLUME	OUNCES VANILLIN PER GALLON MIXTURE AT TEMPERATURE FAHRENHEIT					
	32°	50°	68°	86°	104°	122°
0	0.47	0.68	1.07	1.80	3.10	6.96
5	0.63	0.83	1.35	2.44	5.18	—
15	0.74	1.21	2.35	5.10	15.2	—
25	1.32	2.15	5.35	15.1	73.7	—
50	9.87	18.8	—	—	—	—
70	26.6	36.5	57.5	82.0	102.7	—

SOLUBILITY OF VANILLIN IN GLYCERIN-WATER MIXTURES

PER CENT GLYCERIN BY WEIGHT	OUNCES VANILLIN PER GALLON MIXTURE AT TEMPERATURE FAHRENHEIT					
	32°	50°	68°	86°	104°	122°
0	0.47	0.68	1.07	1.80	3.10	6.96
10	0.51	0.76	1.23	2.00	3.51	7.88
20	0.56	0.83	1.31	2.23	4.03	9.33
50	0.79	1.19	1.92	3.18	5.93	12.9
70	1.11	1.56	2.49	4.20	7.45	16.2

VANILLIN MONSANTO is the culmination of over thirty years of concentrated effort by specialized technicians. This important flavor is skillfully processed in modern equipment under exact scientific control to insure its true aroma, high degree of purity and uniformity.

With production facilities that make it the world's largest manufacturer of vanillin, Monsanto is prepared to meet any demand for this pure, wholesome flavor at stable and economical prices. Solubility charts are shown above—further information and prices will be sent on request. Inquire: MONSANTO CHEMICAL COMPANY, St. Louis, U.S.A. District Offices: New York, Chicago, Boston, Detroit, Charlotte, Birmingham, Los Angeles, San Francisco, Montreal, London.

MONSANTO CHEMICALS

SERVING INDUSTRY . . . WHICH SERVES MANKIND

Formulas for Foods

FORMULA NO. 108

Brittle Wheyfers

Sweetened condensed whey	**5,130 grams or oz.**
Containing:	
whey solids	**39 percent**
sucrose	**39 percent**
Cereal, precooked	**250 grams or oz.**
Nuts	**750 grams or oz.**
Total	**6,130 grams or oz.**

Working Directions

Whip the sweetened condensed whey in a mechanical beater for about 5 minutes, or until its volume is at least doubled. Carefully fold the cereals and nuts into the whipped sweetened condensed whey. Dry the mixture in layers about ¼ to ½ in. thick on screening or cheesecloth so that drying takes place on both upper and lower surfaces. Dry in a tunnel drier at about 80 deg. C. or 176 deg. F. for 24 hours or less depending on temperature and air circulation.

Formula from B. H. Webb and C. F. Hufnagel, Bureau of Dairy Industry, U. S. Department of Agriculture, Washington, D. C.

FORMULA NO. 109

Yorkshire Relish

Tamarinds	**30 lb.**
Onions (peeled and chopped fine)	**14 lb.**
Garlic (peeled and chopped fine)	**4 lb.**
Brown sugar	**20 lb.**
Salt	**25 lb.**
Black pepper	**5 lb.**
Pimentos	**3 lb.**
Mace, ground	**2 lb.**
Cloves, ground	**2 lb.**
Bay leaves	**2 lb.**
Mushroom catchup	**6 gal.**
Chinese soy sauce	**3 gal.**
Caramel	**2 gal.**
Black molasses	**12 gal.**
Malt vinegar (18 grain)	**50 gal.**

Place all ingredients in a steam pan and simmer gently for 30 minutes.

Pass through a 10 mesh sieve.

Fill into containers, stirring continuously.

Another method is to soak the ground spices for 24 hours in water by making into a thin paste. Boil tamarinds in 20 gal. of the vinegar and pass through a pulping machine or fine sieve. Place the pulp along with the other ingredients in a steam pan and boil gently for 15 minutes. Pass through a flat stone mill and fill into containers.

Formula from H. B. Cronshaw, London, England

FORMULA NO. 110

Sauer Rüben

Sauer rüben is a product made by the fermentation of turnips, similar to the method of making sauerkraut.

Better results are obtained from fall turnips. Best size is from 2½ to 3½ in. in diameter. Purple Top Strap Leaf variety seems best to use.

Working Directions (Condensed)

Remove tops, blemishes and all inedible portions from the turnips. Rinse in cold water until clean, but do not wash, for the necessary bacteria may be removed thereby. Do not peel the turnips.

Shred turnips in power driven shredder with 3/16-in. holes. Shreds will be from 1 to 6 in. long and resemble shredded cabbage for sauerkraut.

Place shredded turnip into enameled vessel and mix thoroughly with salt. Use 2.15 to 2.25 percent of salt, which is about 3.5 oz. of salt to 10 lb. of shredded turnip.

Pack the salted, shredded turnip into stone jars fitted with wooden covers. Weight down covers. Allow to ferment until maximum acidity is reached and the acidity starts to diminish.

The product may now be canned with the addition of 2 percent brine. Or it may be stored in original jars by covering with a layer of white mineral oil, in which condition it will keep about six months at room temperature. When storing under mineral oil it is necessary to replace water lost by evaporation.

Formula from Circular 389, U. S. Department of Agriculture, by H. E. Goresline and L. H. James.

Editor's Note: Sauer Rüben is essentially a product for farm consumption, but the formula is published for the benefit of those who are seeking novelties.

FORMULA NO. 111

Short Bread Cookies

Powdered sugar (sucrose)	**55 lb.**
Powdered milk	**4 lb.**
Shortening	**35 lb.**
Coconut oil (76 deg.)	**25 lb.**
Soda	**1 lb.**
Salt	**2 lb.**

Place in mixer and cream.

Whole eggs	**12 lb.**
Water	**22 lb.**
	8 oz.
Invert sirup	**6 lb.**

Add eggs and mix 7 minutes. Dissolve invert sirup in water and add to batch during the last minute of mixing.

Soft winter wheat cookie flour	**200 lb.**
Calcium acid phosphate	**8 oz.**

Add the last dry ingredients and mix just until clear—approximately 3 minutes.

Note: Dough should come out at about 75 deg. F. and should be quite stiff for a Dutch machine.

Bake at 400 deg. F.

FORMULA NO. 112

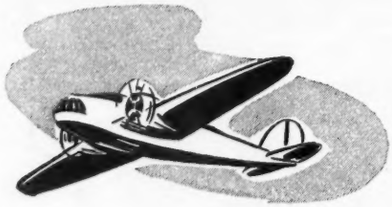
Olive and Pimento Loaf

Veal trimmings	**60 lb.**
Lean pork trimmings	**40 lb.**
Dry milk solids	**15 lb.**
White pepper	**8 oz.**
Paprika	**1 oz.**
Lemon extract	**2 oz.**
Garlic powder	**⅛ oz.**
Pimentos	**3 lb.**
Stuffed olives	**3 lb.**
Salt	**3 lb.**
Quick cure. (See Formula No. 23)	**1 qt.**

Run veal and pork through ⅜-in. plate.

Place veal in silent cutter, add ice, dry milk solids, cure, salt and spices. Then add pork. When chopped fine enough, add pimentos and run a few

USHERING IN A NEW ERA



Synthetic Vitamins Needed in Modern Nutritional Strategy

Failure of famous fixed defenses in the current war should be an object lesson to those who have held that a good American diet afforded ample protection of modern vitamin requirements. The protection counted on has been greatly reduced by vitamin losses resulting from food processing and from changed cooking and eating habits. Into the line of defense against vitamin deficiencies must be introduced highly mobile and efficient armament which can repulse attacking mobile forces and counter-attack where and when desired.

It is easy to mobilize powdered crystalline thiamin chloride, riboflavin and ascorbic acid, for example, and to incorporate them in many products in such strength that, even if these vitamin substances must themselves undergo bombardment by some processing losses, the final outcome is as though the original raw food never suffered any loss of vitamins B_1, B_2, or C. The finished products can actually be given greater strength, so great is the mobility of the synthetic vitamins.

The efficiency of these pure vitamins is illustrated by the minute concentrations required. A tiny milligram of thiamin, for instance, supplies an average adult's full daily requirement. Thus incorporating these substances into products does not call for surrender of distinctive customer appeal, does not necessitate use of elements which may interfere with "eatability" and digestibility.

Action towards general vitamin restoration and fortification of foods has been given added impetus by recent price reductions on synthetic vitamins B_1, B_2, and C. Make sure your company is not left behind. Let our Vitamin Division show you how to utilize these mobile and efficient instruments of both defense and offense against modern enemies of nutrition.

HOFFMANN-LA ROCHE, INC. • NUTLEY, N. J.

WORLD FAMOUS FOR PHARMACEUTICAL CHEMICALS

1868* U.S. GRANT IS NOMINATED PRESIDENT OF THE UNITED STATES

*1868 *Chas. Pfizer & Co. outgrew its modest offices at 17 Beekman Street and moved to 81 Maiden Lane*

¶ Nineteen years old—a sturdy stripling not yet voting age—that was Chas. Pfizer & Co. in 1868. Yet already the foundations were laid for Pfizer's steady future growth and expansion. The firm had already established the reputation it has carried unbroken throughout its ninety years of existence—a reputation for high standards of purity, quality, dependability.

¶ In the years that followed, its reputation steadily spread, as new products were added, new fields of industry opened.

¶ Today Chas. Pfizer & Co. serves industries never heard of in 1868—the modern photographic industry, the great modern domestic dye industry, the new industries concerned with plastics, and many more, together with such old, time-honored industries as food, confectionery and drugs.

¶ And today, at ninety years of age, Chas. Pfizer & Co. is still growing—constantly finding new ways to serve modern industry's ever growing needs.

CHAS. PFIZER & CO., INC.

81 MAIDEN LANE, NEW YORK • 444 W. GRAND AVE., CHICAGO

MANUFACTURING CHEMISTS SINCE 1849

EFF-BEE' Essentials

FLAVORING SUGGESTIONS for SEASONAL SPECIALTIES

OPEN season for Maple Syrups, Mince Meats, Fruit Cakes, Christmas Puddings, etc., will soon be here . . . and for some of these, sales will go a soaring. But why some and not others? The answer can be given in one little word: FLAVOR!

And any manufacturer who collects profit from his product's success, season after season, knows that Flavor, more than any other one factor, determines the ultimate direction of his sales. That is why so many of them enlist the skill and recommendations of FRITZSCHE flavor experts before committing their holiday or seasonal specialties to actual production.

Long experience in the manufacture and sale of Flavoring Bases and Essential Oils has provided our organization with vast reserves of valuable ideas and information—ideas that will enable the manufacturer to produce a more distinctive product . . . information that help him to keep material flavoring costs to a minimum.

Certain valuable suggestions are available right now to manufacturers interested in new ways to improve their Maple Syrups, Mince Meats, Fruit Cakes, Christmas Puddings or other seasonal specialties, and we'll gladly pass them along to responsible manufacturers upon request. Write us *today*.

FRITZSCHE BROTHERS, Inc.
PORT AUTHORITY COMMERCE BLDG., 76 NINTH AVENUE, NEW YORK, N. Y.
BRANCH STOCKS
BOSTON CHICAGO LOS ANGELES ST LOUIS TORONTO, CANADA MEXICO, D. F.
FACTORIES AT CLIFTON, N. J. AND GRASSE (ALPES MARITIMES) FRANCE

revolutions to cut and mix pimentos. They must not be cut too fine. Place mixture in mixer and mix olives.

Place this in greased pan for baking. Bake at 250 deg. F. for 2½ to 3½ hours, depending upon size of pans used. Inside temperature should be 152–155 deg. F.

Formula from Dry Milk Institute

FORMULA NO. 113

Worcestershire Sauce
No. 3

Anchovies	12 lb.
West Indian tamarinds	25 lb.
Sugar	20 lb.
Jamaica ginger	2 lb.
Cloves	1½ lb.
Cayenne pepper	1½ lb.
Chili vinegar	6 gal.
Garlic vinegar	6 gal.
Shallot vinegar	6 gal.
Mushroom catchup	4 gal.
Japanese black soy sauce	4 gal.
Port wine lees	2 gal.
Lime juice	2 gal.
Malt vinegar (16 grain)	24 gal.

Simmer the mixture for an hour and pass through a pulping machine fitted with a fine sieve.

Formula from H. B. Cronshaw, London, England

FORMULA NO. 114

Nougat Centers for Chocolate Dipping

Unit	Ingredients	Test Batch	Production Batch
A	Egg Albumen	½ oz.	5 oz.
	Water	1 oz.	10 oz.
B	Sugar	2 lb.	20 lb.
	Water	1 pt.	4 qt.
	Honey	½ lb.	5 lb.
C	Corn sirup	2 lb.	20 lb.
D	Frappe (See Formula No. 33)	½ lb.	5 lb.
E	Corn sirup	2 lb.	20 lb.
	Honey	½ lb.	5 lb.
	Water	½ pt.	2 qt.
F	Dry milk solids[1]	½ lb.	5 lb.
G	Hard fat	5 oz.	4 lb.

[1] Contains not more than 1½ per cent butter fat and not over 5 per cent moisture.

Method

Dissolve A. Place in beater and start beating slowly.

The egg albumen should be beaten quite stiff before B is added.

Mix B, cook to 230 deg. F., add C.

If it bears the "D & O" Label you are assured of QUALITY and UNIFORMITY

D&O ESTABLISHED IN 1798

FLAVOR in the canning and allied industries plays as essential a part as in all other industries.

"D & O" OLEO RESIN

CELERY
Complete flavor of the seed

RED PEPPER
More uniform than the spice

GINGER
Complete flavor of the spice, including the natural bite.

We are in position to offer you for prompt or future delivery.

DODGE & OLCOTT COMPANY
180 VARICK STREET, NEW YORK, N.Y.
Boston • Chicago • Philadelphia
St. Louis • Los Angeles
Plant and Laboratories: Bayonne, N. J.

RAW MATERIALS

Practically every Food Manufacturer depends upon some other branch or branches of the Food Field as a source of his Raw Materials.

MATERIALS FOR THE FOOD MANUFACTURER

Many of these materials are advertised in this issue under the heading—MATERIALS FOR THE FOOD MANUFACTURER.

There is an index to Raw Materials advertised in this issue on page 108.

Cook to 243 deg. F., cool somewhat and add gradually to A after A is beaten quite stiff.

Add D and continue beating.

Cook E to 270 deg. F. Cool somewhat and add to A+B+C+D. Mix thoroughly and add F in dry form.

Add G and mix thoroughly.

Pour on greased cooling slab, then cut into desired size pieces before dipping.

It is advisable to heat the fat somewhat before adding to batch.

FORMULA NO. 115

Smoked Metwurst

Bull meat or boneless chucks	**30 lb.**
Back fat	**15 lb.**
Hog stomachs	**10 lb.**
Beef trimmings	**45 lb.**
Dry milk solids	**3½ lb.**
Ice	**3½ lb.**
White pepper	**6 oz.**
Coriander	**2 oz.**
Allspice	**2 oz.**
Nutmeg	**2 oz.**
Garlic powder	**¼ oz.**
Salt	**3 lb.**
Quick cure (Formula No. 23)	**1 qt.**

Chop hog stomachs fine in silent cutter. Add ice and part of cure while chopping. Run bull meat, back fat, and beef trimmings through ⅛-in. plate. Put all meat in mixer and add the rest of the cure and spices, mix well. Stuff in beef rounds. Let hang in cooler over night, then smoke until desired color is obtained. Cook 30 minutes at 160 deg. F. Give cold shower.

See also general directions for sausage manufacture (Formula No. 22).

Formula from Dry Milk Institute

FORMULA NO. 116

Polish Sausage No. 1

Cured bull meat	**60 lb.**
Cured regular pork trimmings	**20 lb.**
Cured lean pork trimmings	**20 lb.**
Dry milk solids	**3½ lb.**
Black pepper	**7 oz.**
Coriander	**2 oz.**
Garlic	**4 oz.**

Grind bull meat through ⅛ in. plate. Place in chopper, add ice and dry milk. Chop fine. Grind pork through ⅛ in. plate. Place beef and pork in mixer. While mixing add seasoning.

Mix well, then place tight in stuffer and stuff in wide beef middles or artificial casing 18 to 22 in. long. Smoke in 120 to 150 deg. F. until the desired color is obtained. Then cook 30 to 45 minutes in 160 deg. F. Spray

Two NEW and Amazing Starches!

"MELOJEL" National's Latest Contribution to the Food Industries

- Made from Corn—by highly-specialized processes similar to those used in the manufacture of our "Purity" Starches— **MELOJEL** offers distinctive properties never before obtainable in Corn Starch.
- **MELOJEL** is vastly superior to ordinary Corn Starches —in "gel," in smoothness, in appearance, and in the improved flavor resulting from its use, for **MELOJEL** has *no cereal taste!*
- **MELOJEL** is made in two qualities, each with special characteristics:

  "MC"—for Puddings, Pie Fillings, and other foods cooked with milk.

  "LF"—for Pie Fillings made with fruit, berries, or lemon. Also an excellent bodying agent for Salad Dressings.

- **MELOJEL** is admirably adapted for use in Soups, Gravies, Ice Cream Cones, or any food product in which Starches are used.

Write for a trial bag—either or both qualities—on approval, giving full particulars. With the facilities of our Laboratory and Food Kitchen, we are equipped to work with you to mutual advantage.

NATIONAL STARCH PRODUCTS Inc.

820 GREENWICH STREET, NEW YORK

FOOD and BEVERAGE MANUFACTURERS Prefer DU PONT Edible LACTIC ACID

• To improve flavor, taste and odor, many food and beverage manufacturers are using DU PONT Edible Lactic Acid. This product also provides better control of acidity and food preservation.

Order DU PONT Edible Lactic Acid today. A trial will prove its value in food and beverage preparation.

•

Visit the du Pont *Wonder World of Chemistry* Exhibits at the New York World's Fair and on the Boardwalk at Atlantic City.

E. I. DU PONT DE NEMOURS & CO.
INCORPORATED
GRASSELLI CHEMICALS DEPARTMENT
WILMINGTON · DELAWARE
DU PONT

or submerge in cold water for 5 to 10 minutes.

See also General Directions (Formula No. 22).

Formula from Dry Milk Institute

FORMULA NO. 117

Bologna No. 2

Beef trimmings	40 lb.
Beef tripe	20 lb.
Hog tripe	20 lb.
Beef hearts	10 lb.
Back fat (diced)	10 lb.
Dry milk solids	3½ lb.
White pepper	6 oz.
Allspice	2 oz.
Onion powder	½ oz.
Garlic powder (optional)	½ oz.
Coriander	1 oz.
Salt	3 lb.
Quick cure (Formula No. 23)	1 qt.

See also General Directions (Formula No. 22).

Formula from Dry Milk Institute

FORMULA NO. 118

Fudge

Unit	Ingredients	Test Batch	Production Batch
A	Sugar	2½ lb.	25 lb.
	Dry milk solids[1]	3 oz.	2 lb.
	Water	1½ pt.	5 qt.
	Stabilizer	¼ grams	2½ grams
B	Corn sirup	4 oz.	2½ lb.
C	Fondant (See Formula No. 24)	4 oz.	2½ lb.
D	Salt		to taste
	Flavoring		to taste

[1] Contains not more than 1½ per cent butter fat and not over 5 per cent moisture.

Method

Mix the sugar, dry milk solids and stabilizer, (CaO, $NaNO_3$, Na_2CO_3, $(NH_4)_2CO_3$ or MgO). Gradually add water, making at first a paste, then a semi-liquid mass. Heat batch on fire slowly, bring to boil.

The stabilizer is really unnecessary but through its use the goods will have a fresh flavor for a longer period.

When batch starts to boil, add corn sirup.

Cook batch to 230–235 deg. F. Take off fire, allow to cool to about 170 deg. F. Add fondant (Formula No. 24.) Mix in thoroughly, scraping down sides of kettle.

Before batch becomes too stiff add D. Then pour on oiled paper.

The FOOD MANUFACTURING INDUSTRY is relatively DEPRESSION PROOF

THE food manufacturing industry produces approximately 296 billion pounds of food annually . . . in good times and bad.

NEW types of processed foods are being developed constantly . . . competing for a share of the market, requiring new processes and new equipment.

FOOD INDUSTRIES reaches *this market.*

FOOD INDUSTRIES

ABC ABP

A McGraw-Hill Publication
330 W. 42nd St., N. Y.